

Mississippi Phosphate Corporation
Pascagoula, Jackson County, MS



Engineering Evaluation/Cost Analysis

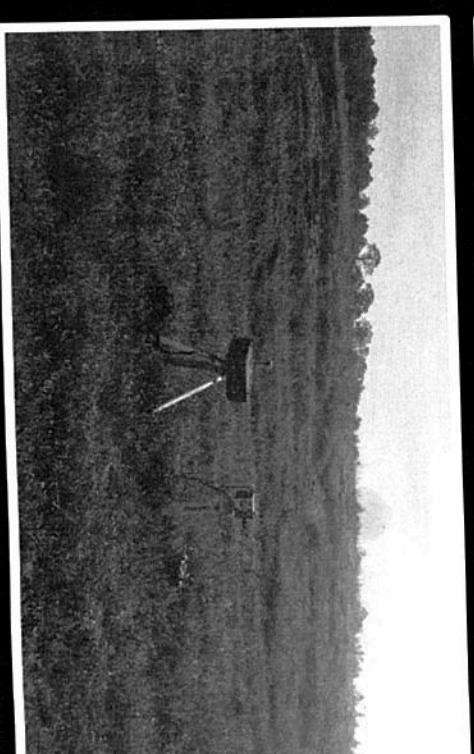
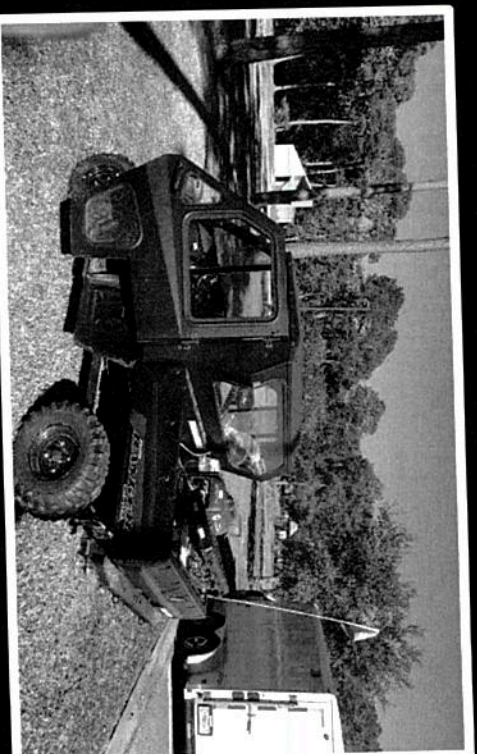
Closure of the East Gypsum Stack and North Ponds
U.S. EPA Region 4 – Superfund Division

January 11, 2018

Site Status



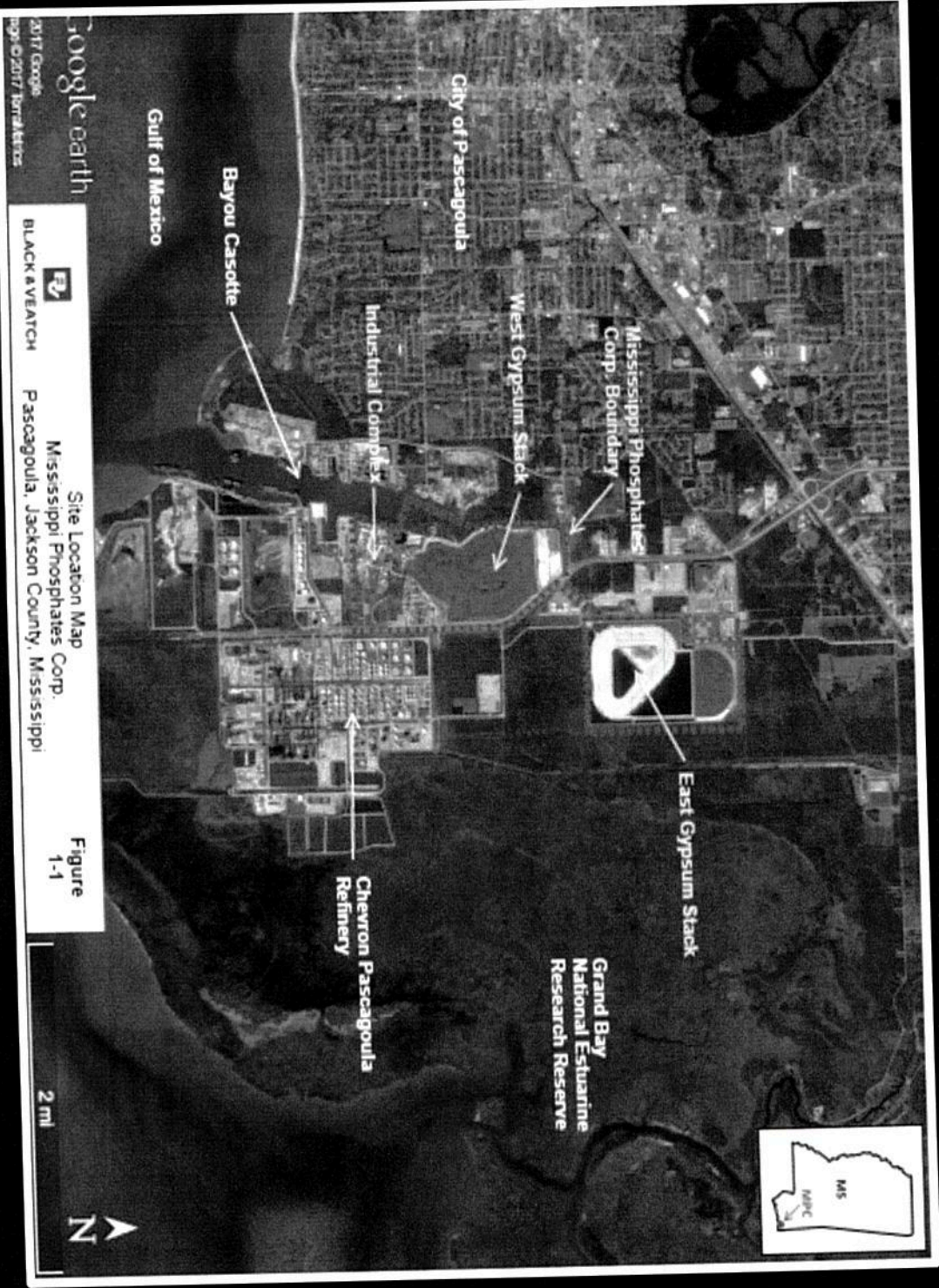
- Update on water treatment operations
- Radiation sampling
 - EPA conducted sampling November 27 - December 5 per concerns at last public meeting
 - Sampling was conducted at public parks (Soccer Complex, and IG Levy Memorial Park) and public schools (Pascagoula High, Cherokee Elementary and Eastlawn Elementary)
 - Collected air samples, soil samples and conducted gamma surveys
 - Samples submitted to the EPA National Analytical Radiation Environmental Laboratory (NAREL) in Montgomery, AL
 - Analyzed for Gamma spectroscopy, Alpha spectroscopy – Thorium, Alpha spectroscopy – Uranium
- Results available in February



MPC Site History/Background

- Produced diammonium phosphate (DAP) from 1950s thru 2014
- Digested phosphate ore with sulfuric acid to produce phosphoric acid
 - Waste product = gypsum
 - West Gyp Stack closed out mid 2000s
 - East Gyp Stack has 350 acres of acid generating material exposed (\approx 15 Million CYs)
- Phosphoric acid + ammonium = granulated DAP
- Declared bankruptcy; July 2015 settlement agreement
 - Liquidation Trust = infrastructure/dock
 - Environmental Trust = lime treatment plant + West/East Gyp Stacks
 - \$12 Million provided for water treatment





Site Location Map
Mississippi Phosphates Corp.
Pascagoula, Jackson County, Mississippi

Figure 1-1

Current Operations

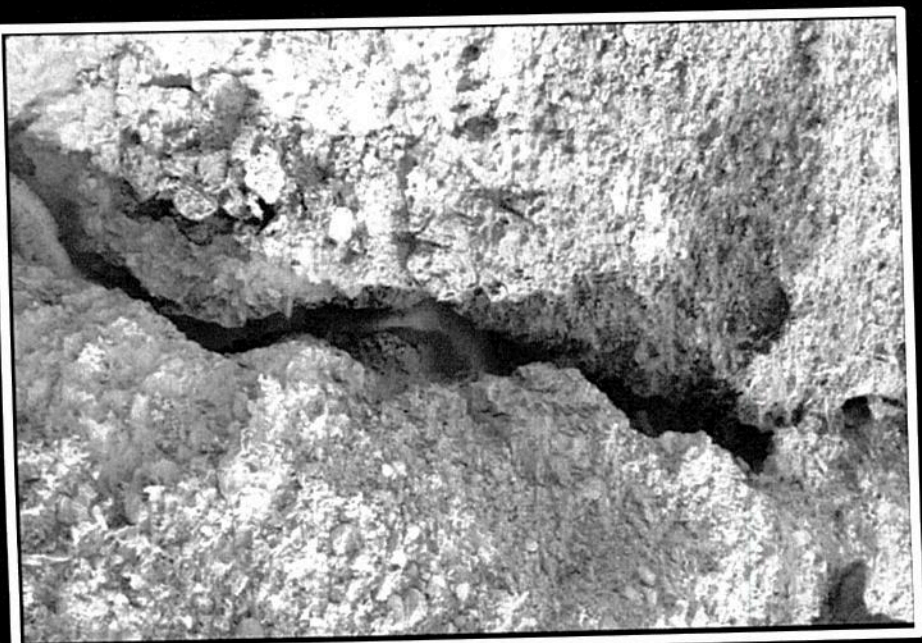
- EPA R4 Removal Program assumed water treatment responsibility February 11, 2017
 - > 500 MGs of water on-site with $\text{pH} \approx 2.4$
 - Burn rate $\approx \$1+$ Million/month
- 1" of rainfall = 9 MG of acidic water that must be treated
 - 112" rainfall in 2017
 - Average rainfall = 66"/year
- Lime plant + in-situ plant
 - 2 to 4 MGD average treatment volume
 - Neutralize pH and remove nutrients
 - Cost = \$0.010186 per gallon (actual)
- Removal funding thru June 2018
 - Total costs to date > \$13 Million



Emergency By-Pass Operations



- Dikes, berms & ponds of East Gyp Stack have structural integrity issues
 - Overtopping/desiccation/piping, etc.
 - Confirmed by multiple inspections
- Known uncontrolled releases of wastewater
 - 2005 – 17 MGs to Bangs Lake/Grand Bay Estuary
 - Decimated large portion one of most productive fisheries on Gulf Coast
 - 2013 – 38 MGs to Bayou Casotte
 - 47,000 dead fish + criminal violation of Clean Water Act
- By-passes managed by EPA
 - pH neutralization only with sodium hydroxide
 - ≈ 400 MGs over 5 events
 - Treatment costs per gallon = \$0.015727
 - Closely monitored to prevent eutrophication and algal blooms
 - No adverse impacts observed



Region 4 Superfund Strategy

- Integrated removal & remedial authorities
 - Recently added to Administrator Pruitt's list for immediate and intense action
- Proposed to NPL on August 3
 - Public Meeting August 15
 - Comment period ended October 2
 - Public comments support listing/MDEQ concurs
 - Final on NPL January 18, 2018
- Need to get out of the rainwater treatment business
 - Common acid mine drainage strategy
 - Keep clean water clean
 - Reduce quantity & improve quality that requires treatment
 - Achieve long-term management of leachate only ASAP
- Non-Time Critical Removal Action Framework for East Gyp Stack closure work (R4 Remedial Program = lead)
 - Cleanup plan called Engineering Evaluation/Cost Analysis (EE/CA)
 - Work split into 3 phases over 3 consecutive years (2018, 2019 and 2020)
 - Operations & maintenance will be transferred to MDEQ upon closure





East Gypsum Stack

Features of the East Gypsum Stack
Mississippi Phosphates Corp.
Pascagoula, Jackson County, Mississippi

Figure 2-4
BLACK & VEATCH



North Ponds





Phase 1 – EGS Closure

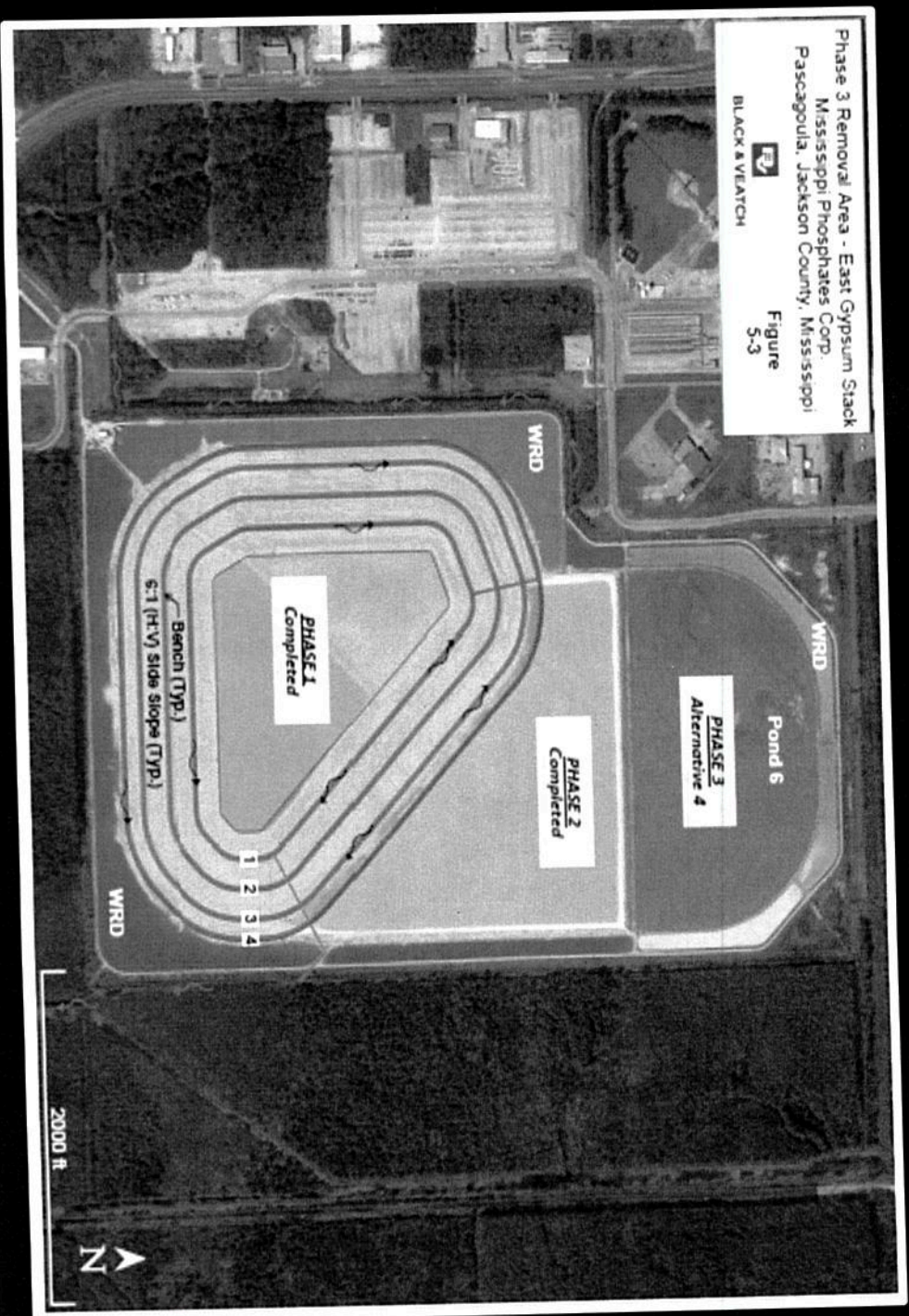


Phase 2 -- EGS Closure





Phase 3 – EGS Closure



Alternatives Evaluated in EE/CA

- Alternative 1: Continue Water Treatment Operations
 - \$5.6 Million/year
 - Assumes average rainfall of 66" - 22" of evaporation

• Phase 1 – Alternative 2A: Partial Liner

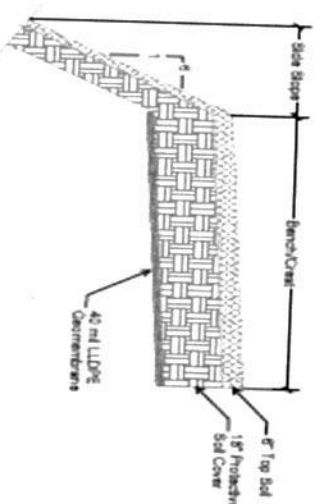
- Reduces water contact area by 155 acres (41%)
- Drain Ponds 3 & 4. Deal with lime in Pond 4. Regrade EGS footprint.
- 40 mil liner on crest & benches (Four, 30-foot wide benches)
- 24 inches of soil cover on top of liner
- Compacted clay and top soil *only* on side slopes
- Vegetative cover
- Total Cost = \$ 31.8 Million

• Phase 1 – Alternative 2B: Complete Liner

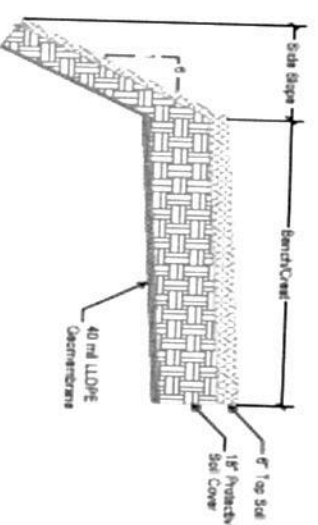
- Drain Ponds 3 & 4. Deal with lime in Pond 4. Regrade EGS footprint.
- 40 mil liner on crest, benches, and side slopes
- 24 inches of soil cover on top of liner
- Requires 541,000 cubic yards of soil
- Vegetative cover
- Total Cost = \$31.4 Million



Alternative 2A Cover Profile



Alternative 2B Cover Profile





Alternatives Evaluated in EE/CA (con't)

- Phase 2 – Alternative 3A: Pond 5 Closure with North Pond Excavation
 - Reduces water contact by additional 90 acres (64%)
 - Drain Pond 5. Excavate 728,000 CYs of lime from North Ponds. Incorporate into Pond 5 footprint.
 - 40 mil liner over Pond 5 footprint and North Ponds
 - 24 inches of soil with vegetative cover
 - Total Cost = \$47 Million
- Phase 2 – Alternative 3B: Pond 5 Closure with North Ponds Capped in Place
 - Drain Pond 5, backfill and grade
 - Reinforced geotextile over lime sludge with North Ponds
 - 40 mil liner over Pond 5 footprint and North Ponds
 - 24 inches of soil with vegetative cover (291,000 CYs of soil)
 - Total Cost = \$18.4 Million
- Phase 3 – Alternative 4: Pond 6 Closure and Water Return Ditch
 - Drain Pond 6 and Water Return Ditch (Removes remaining 135 acres/100% closure)
 - Install new perimeter leachate collection system and connect to existing French drain system
 - Grade Pond 6 and WRD/40 mil liner/24 inches of soil with vegetative cover (400,000 CYs of soil)
 - Total Cost = \$21.8 Million

Preferred EGS Closure Alternative



- Phase 1: Alternative 2B – Complete Liner
 - Provides more long-term protection and less leachate
 - Requires \$31.4 Million
 - Detailed design early 2018/Construction start and finish in 2018
- Phase 2: Alternative 3B – Pond 5 Closure with North Ponds Capped in Place
 - Excavation of North Ponds expensive and unnecessary
 - Requires \$18.4 Million
 - Detailed design conducted in 2018/Construction start and finish in 2019
- Phase 3: Alternative 4 – Close Pond 6 and Water Return Ditch
 - Requires \$21.8 Million
 - Detailed design 2019/Construction start and finish in 2020



Preferred EGS Closure Alternative

- Total EGS Closure Costs \approx \$71.6 Million
 - Closure costs are likely high end estimates (10% contingency + 8% contractor mark-up)
 - Cost savings opportunities
 - Dredge spoil potentially available from local source for capping material
 - 24" soil cover is from Florida gypsum stack closure regulations. Less soil cover possibly sufficient.
- Above EGS Closure Costs include water by-pass costs to empty the ponds and ditches
 - However, the EGS Closure Costs DO NOT include on-going water treatment costs

Next Steps



- 30 Day Public Comment Period on EGS Closure Alternatives
 - January 11 - February 10, 2018
 - Submit comments via email: Zeller.Craig@epa.gov
 - Submit comments via US mail: US EPA Region 4; 61 Forsyth Street, SW; Atlanta, GA 30303
- EPA to prepare Action Memorandum and respond to comments
- Start detailed design process
 - Develop plans, drawings, and specs for construction activities
- Secure required funding for 3 phase EGS closure
- Site-wide investigation and cleanup will follow

Questions?



- Craig Zeller, P.E. - EPA Remedial Project Manager
 - Zeller.Craig@epa.gov
 - 404.273.7072 (cell)
- Jordan Garrard - EPA On-Scene Coordinator
 - Garrard.Jordan@epa.gov
 - 678.644.8648 (cell)



Mississippi Phosphates Corporation



August 2017
Jordan Garrard
On-Scene Coordinator
Craig Zeller
Remedial Project Manager
EPA Region 4



Background

Mississippi Phosphate Corporation began site activities in the 1950s.

- Produced Diammonium Phosphate (DAP)
- Phosphoric acid is produced by the digestion of phosphate ore with sulfuric acid yields phosphoric acid and phosphogypsum (gypsum).
- Phosphoric acid and ammonium are reacted together to produce DAP
- The gypsum is piped to waste stacks





Background

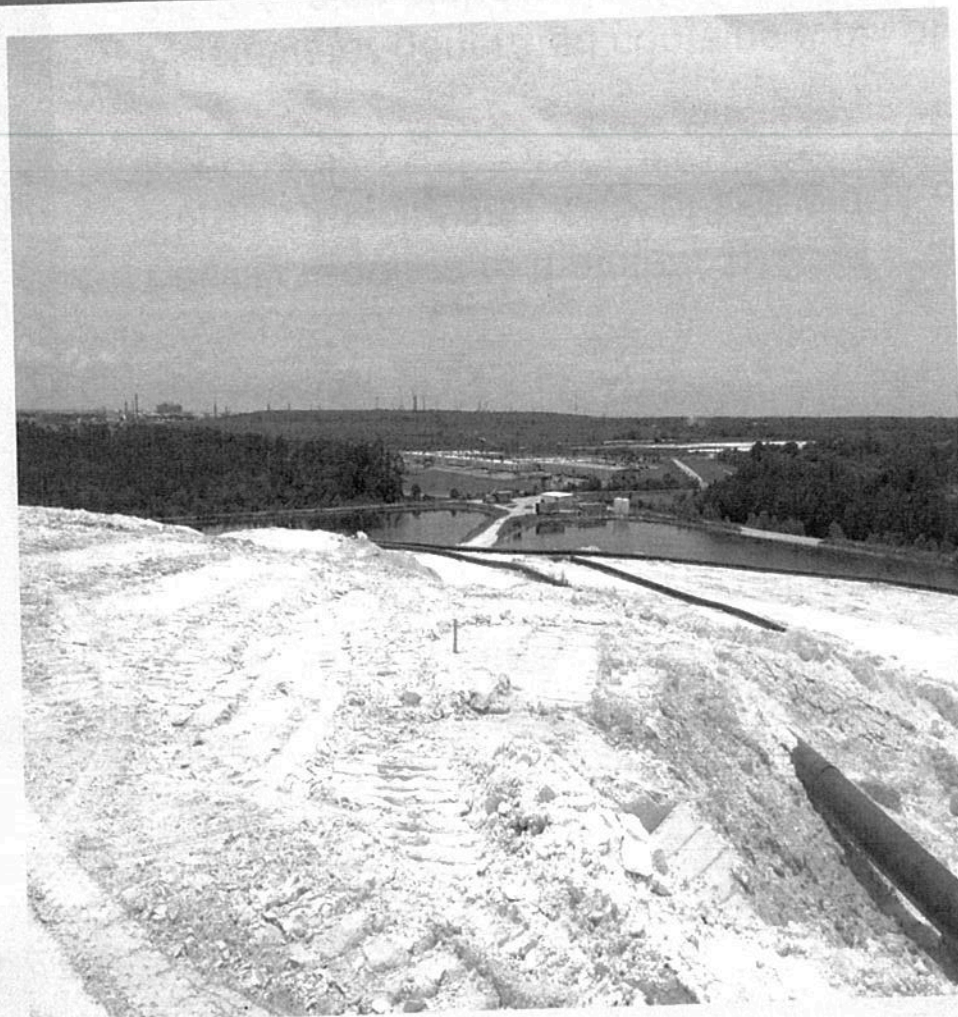


- Wastewater is generated through precipitation runoff and percolation through the waste stacks
- 1" of rain = 9.5 million gallons of wastewater
- Facility required to maintain 10.2" of Surge capacity and 2.25' of site wide freeboard
- Wastewater generated contains a pH of 2.1-2.4, also high levels of phosphate and ammonia
- Wastewater is sent to wastewater treatment plant (WWTP) prior to permitted discharge into Bayou Casotte



Background

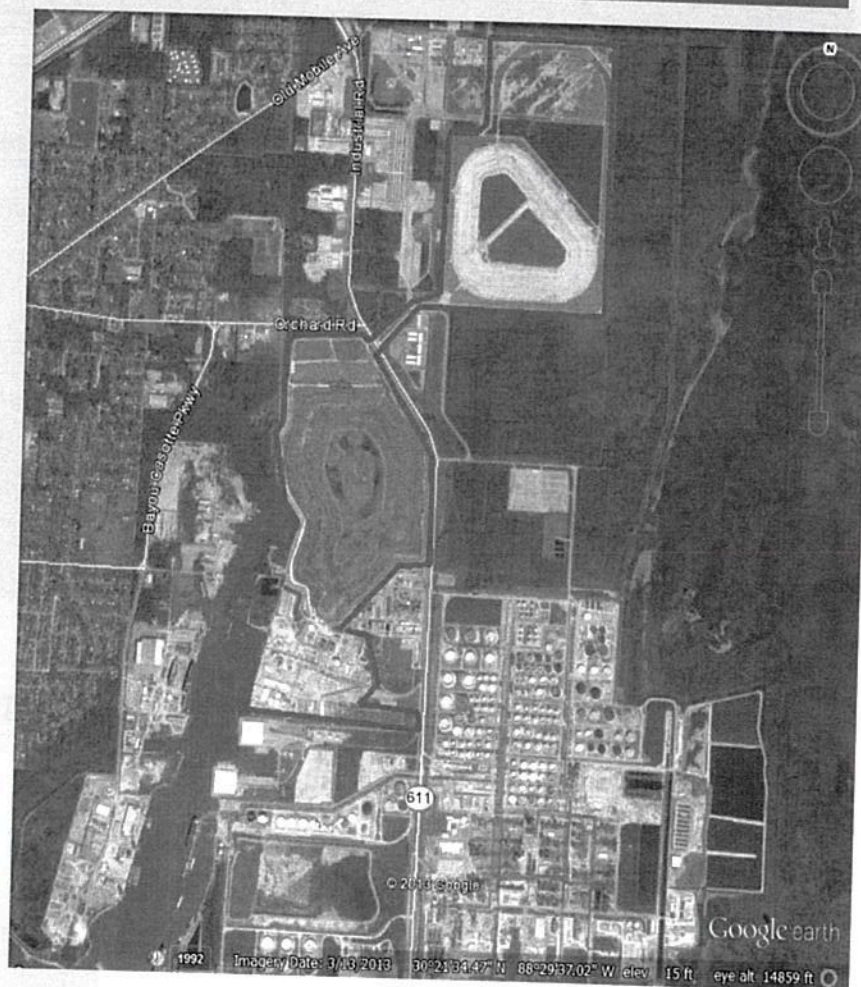
- In 2003 MPC declared bankruptcy and was reorganized and began site operations again in Dec. 2004.
- In Oct, 2014 MPC declared Chapter 11 bankruptcy. Operations ceased in Dec. 2014
 - 2 trusts were created
Environmental Trust and
Liquidation Trust





Environmental Trust

- The ET assumed ownership 616 acres consisting of East and West Stack, North Ponds, DAP Ditch, WRD, WWTP, and Outfalls.
- The Liquidation Trust assumed control and ownership of the DAP plant, ammonia tank, sulfuric acid plants, and dock
- The Environmental Trust (ET) was operating the facility on a day-to-day basis and continued to treat and discharge, as well as manage, water currently stored on-site at the former MPC site. Allen Engineering was operating the WWTP while Project Navigator was managing Trustee





Liquidation Trust

- Liquidation Trust is currently marketing the redevelopment of the facility.
- Anhydrous Ammonia storage and loading (truck and rail car) is continuing
- Receive ammonia through ship/barge





Pond Capacities

- Water Return Ditch (WRD) and Pond 6 – 130 MG
- Pond 3 – 100 MG
- Pond 4 – 25 MG
- Pond 5 – 200 MG
- Pond 6 – 130 MG
- North Ponds – 52 MG
- DAP Ditch – 91 MG
- S-Pond – 4 MG
- **TOTAL – 732 Million Gallons**





Wastewater Treatment

- The primary treatment method to add lime and polymer to the waste water.
- The addition of lime increases the pH and allows for metals and dissolved nutrients to settle out of solution.
- Treatment occurs in the WWTP and in-situ process (WRD at Pond 6)
- The treated water travels through the S pond to strip NH_3 then is buffered again with sulfuric acid prior to being discharged through NPDES permitted outfall 003 in Bayou Casotte





In-Situ Wastewater Treatment Plant

- Currently utilizing WRD around Pond 6 as ISWWTP Cell

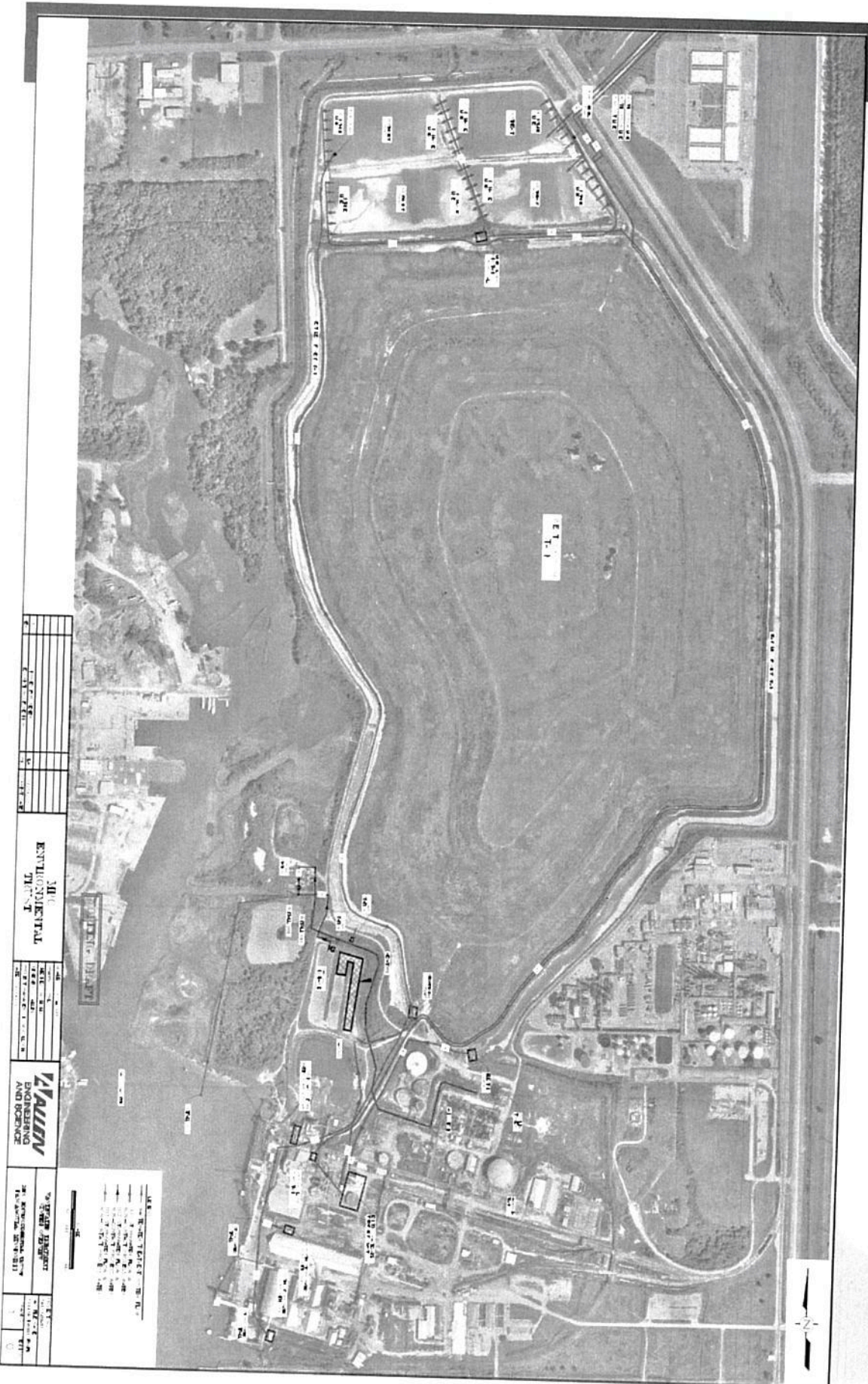




In-Situ Wastewater Treatment Plant



- The ISWWTP utilizes recycled lime for the WWTP to treat wastewater
- The water is monitored during treatment process, then neutralized and discharged into Bayou Casotte



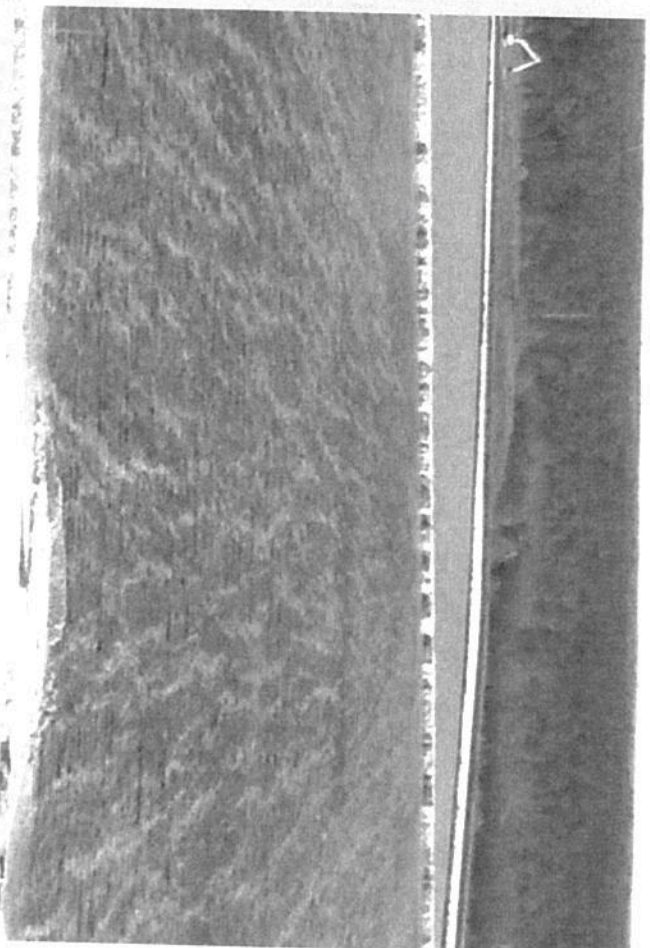


Current Status

- The Environmental Trust operated the facility from Oct 2015 to Feb 10, 2017.
- Initial funding came from Financial Assurance held by MPC ~ \$11,500,000
- MDEQ provided additional \$500,000 in to Environmental Trust in Jan 2017.
- On February 11, 2017 the EPA assumed the wastewater operations

Goals

- Treat wastewater at minimum rate of 2 MGD
- Maintain required 10.2" of surge and 2.25' freeboard





Surge Capacity and Freeboard

- Surge Capacity – amount of rainfall that the pond/ditch system can contain at any given time over the watershed of the system that does not impede into the safety freeboard.
- Freeboard –measure of how full the pond/ditch system is at any given time. For instance, a 2-foot freeboard means that a pond is within 2 feet of being completely full – 2 feet from the top.





Current Status: August 11, 2017

Water treated since Feb 11, 2017: 398,600,000

Current Surge Capacity: 3.7 inches

EPA extramural expenses: \$5,823,451



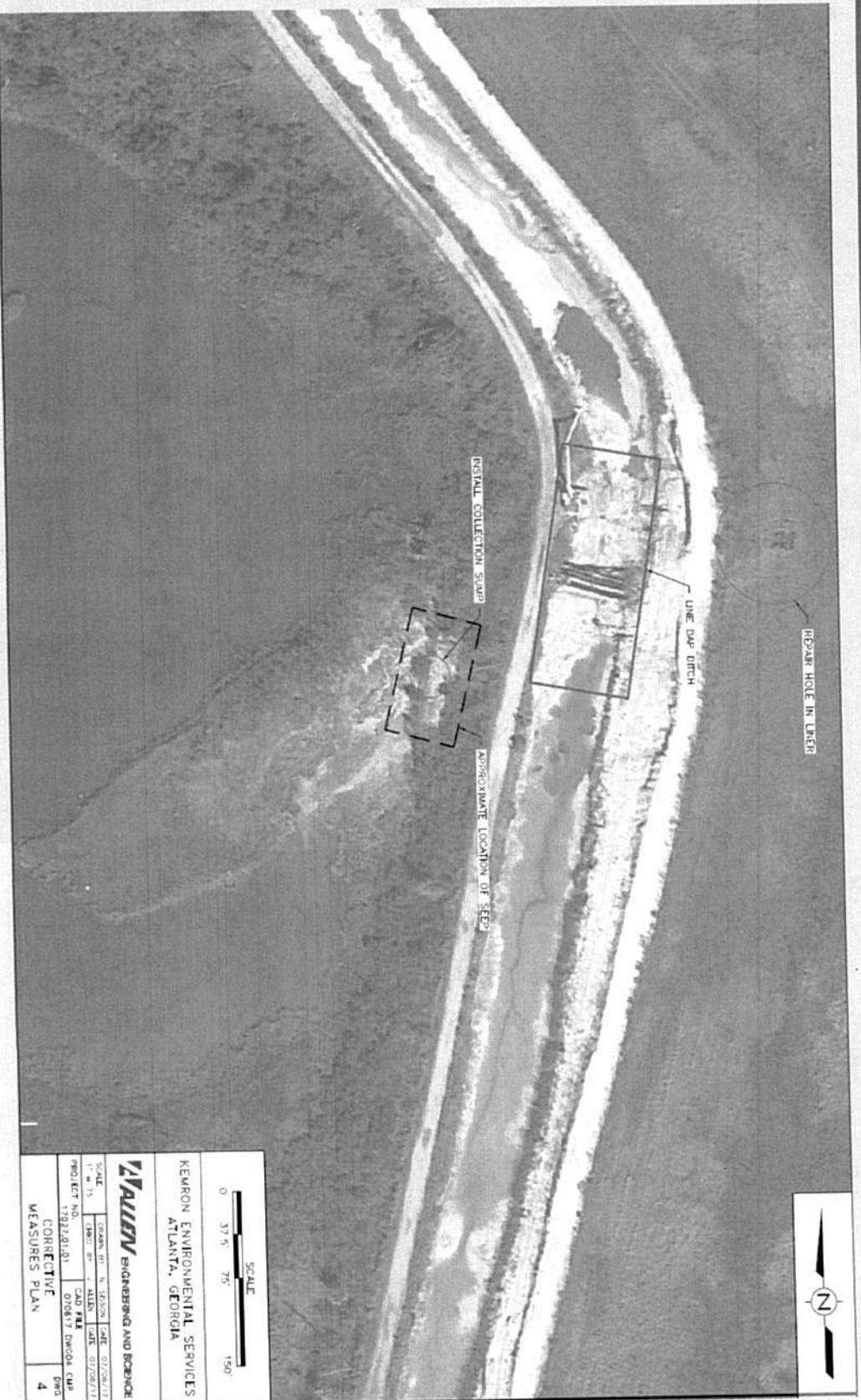


June 29th Release

- At 16:00 June 29th up to 3,000,000 gallons of waste water was released
 - A tear in the liner of west stack caused a sink hole to develop draining the DAP ditch into the Bayou Casotte
 - Notifications made per the Spill Contingency and Bypass Plan
 - The release was secured by 17:15
 - Repairs began on August 7th and will be completed in 3 weeks
 - Additional assessments of the west and east stack are planned

West Stack Sink Hole







Precipitation

- The site averages 66" of rain per year
- 1" of rain generates approximately 9,500,000 gallons of wastewater
- 1/1/17-8/11/17 – 73.28"
- 696,160,000 gallons of water



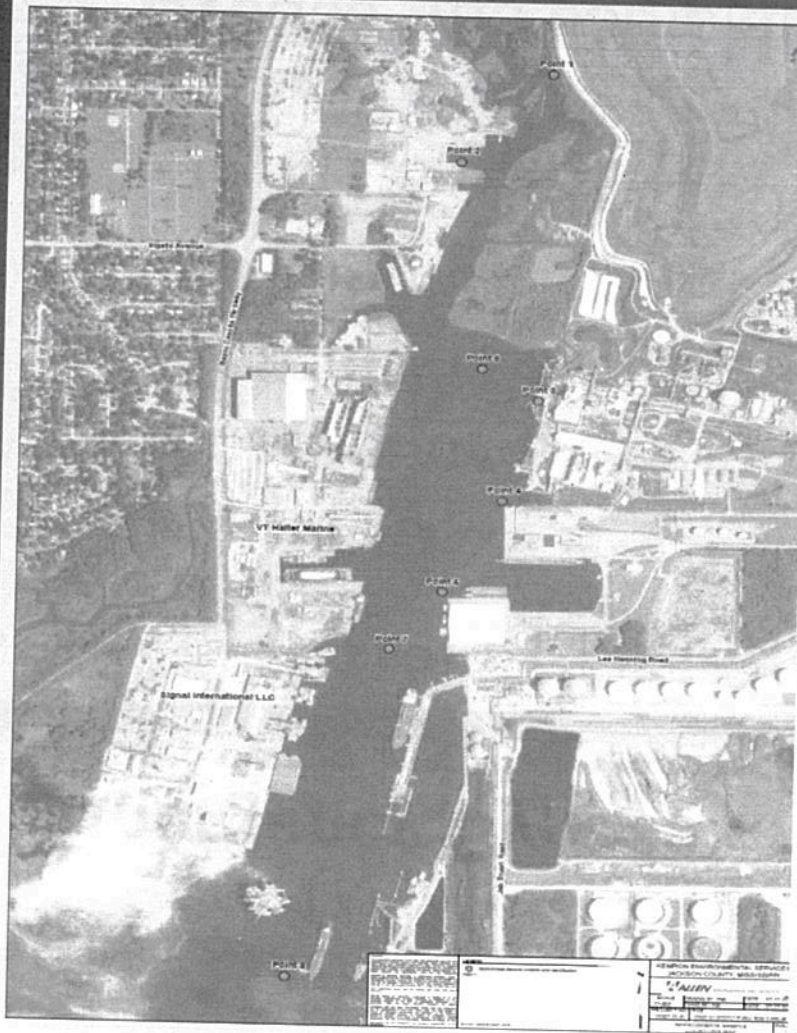


Emergency Bypass

- July 18th leaks on pond 3 discovered
 - Water level was lowered ~3' to make repairs
- July 24th, 4.5" of rain fell within ~ 4 hours, 0.25" forecasted
 - Water levels came within 2" of emergency spillway, water was diverted into emergency storage pond 6
 - 3" of additional rainfall would flood the ISWWTP, 1.25" of rain forecasted over 7 days
 - Based on forecasted rains and protecting the ability to continue to treat wastewater an emergency bypass of 30,000,000 gallons of partially treated water was authorized



Emergency Bypass



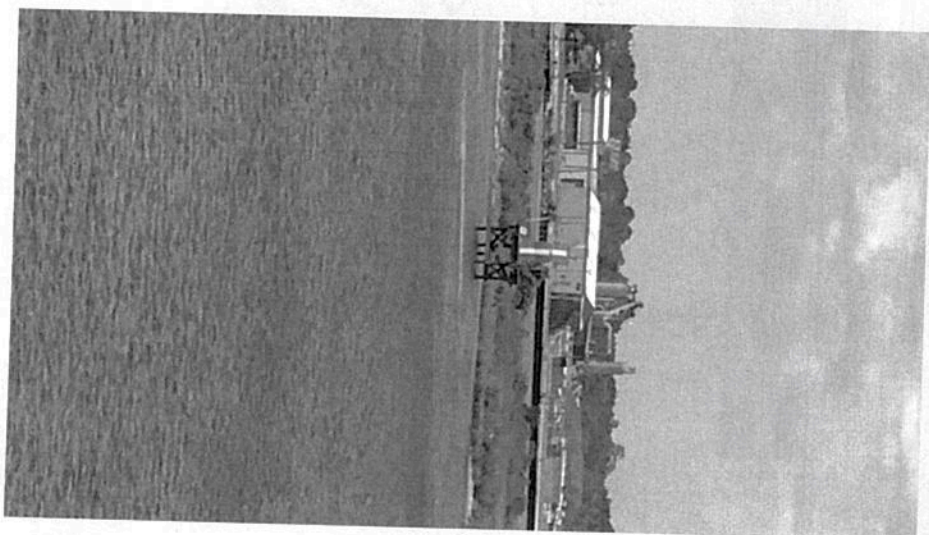
- Based on the Contingency Plan notifications were completed and surface water sampling was conducted at 8 locations within Bayou Casotte
- No fish kills or adverse impacts to the environment observed
- Completed on Aug 1st



Emergency Bypass

- August 2nd additional 3-4" on rainfall was forecasted
 - Emergency storage only had 4" of capacity
 - In order to ensure continued wastewater treatment in the ISWWTP a 2nd emergency bypass of 30,000,000 gallons was initiated per the Contingency Plan
 - Bypass was completed on August 9th

Emergency Bypass





Proposed Actions

- ERRPB will continue to operate WWTP and maintain stacks and berms until September 30, 2018.
 - Currently funding is estimated to last till 11/1/17





Proposed Actions

- Regrade the side slopes of the east stack, install let down pipes to allow for the redirection of storm water runoff into pond 6
- Storm water runoff is less contaminated than leachate or pond water, cheaper / quicker to treat
 - Costs ~ \$750,000
 - Savings ~ \$1,500,000 in water treatment
 - Consistent with future remedial actions



National Priorities List

- Removal Program of EPA Region 4's Superfund Division will continue water treatment operations.
- Remedial Program of EPA Region 4's Superfund Division will address closure of the East Gypsum Stack and other long-term environmental investigations & cleanup of the Plant Site.
- The National Priorities List (NPL) includes the most contaminated industrial/hazardous waste sites in the U.S. that require investigation and cleanup.
- EPA uses the Hazard Ranking System (HRS) to evaluate sites for inclusion on the NPL.
 - Evaluates human health and environmental exposure to groundwater, surface water, soil and air
 - If the HRS score >28.5 , site is eligible for the NPL
 - MPC HRS score = 50 (surface water pathway only)



National Priorities List

- EPA proposed the MPC site to the NPL on August 3, 2017.
- The State of Mississippi (MDEQ) concurs with this action.
- 60 day public comment period ends on October 2, 2017.
- EPA will consider all public comments before deciding to formally add the MPC site to the NPL.
- Specific document requests and questions:
 - Cathy Amoroso, (Region 4 NPL Coordinator)
 - Amoroso.C@epa.gov
 - 404.562.8637



To comment on the MPC NPL Proposal

On-Line Option:

www.regulations.gov

enter: **EPA-HQ-OLEM-2017-0075**

Mail comments to:

U.S. Environmental Protection Agency
EPA Superfund Docket Center, Mail Code 28221T
1200 Pennsylvania Avenue NW.
Washington, DC 20460

(Docket # **EPA-HQ-OLEM-2017-0075**)



Why the National Priorities List?

- Provides potential for Federal funding
 - Remedial Action Priority Panel
- Comprehensive framework for environmental investigations, human health/ecological risk assessments, design/construction of a protective remedy
- Includes community and State of MS input into the process
- Grants available for technical assistance to community



Next Steps

- Highest priority: Close out East Gypsum Stack
 - Reduce the volume (quantity) of water that requires treatment
 - Eliminate rain water contact with gypsum
 - Improve the quality of water that requires treatment
- Initiate engineering feasibility study to evaluate closure alternatives and costs
- Interim Action Record of Decision for East Gyp Stack closure when site becomes Final on the NPL
 - Anticipated early 2018
 - Go to Remedial Action Priority Panel for funding
- Gather existing data and start site wide investigations and human health/ecological risk assessments



Community Involvement Resources

- <http://www.epa.gov/superfund/superfund-community-involvement>
- Participate in public meetings and availability sessions
- Provide comments to EPA on documents (i.e. community involvement plan)
- Technical Assistance Grants
- Community Advisory Group
- Technical Assistance Services for Communities

Questions



Jordan Garrard

Craig Zeller

Kyle Bryant

SUPERFUND PROGRAM WORKSHOP FOR

MISSISSIPPI PHOSPHATES CORPORATION (MPC) SUPERFUND SITE

MARCH 3, 2018



AGENDA

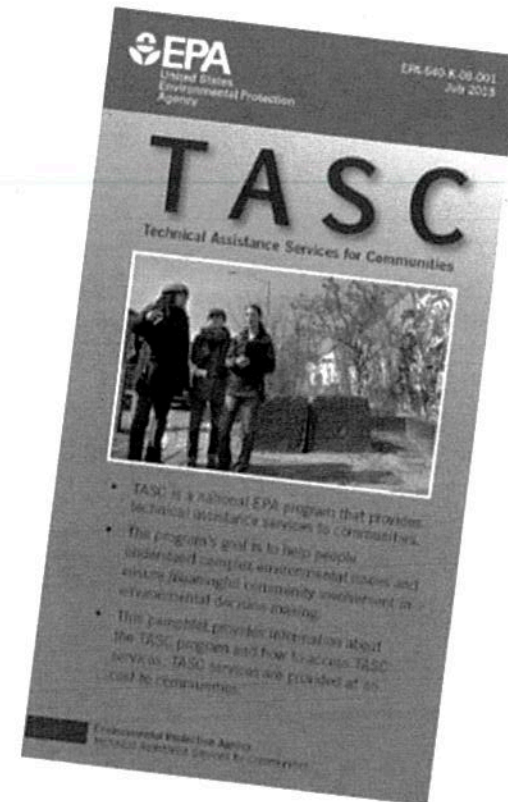
- TASC Overview
- Site Background and Status
- What is Superfund?
- The Superfund Remedial Process
- Superfund Community Involvement Programs
- Making Effective Comments



TASC OVERVIEW

TASC

- Technical Assistance Services for Communities (TASC)
- Provides non-advocacy, independent technical assistance
- This workshop is funded by EPA's TASC program – its contents do not necessarily reflect the policies, actions or positions of EPA





SITE BACKGROUND AND STATUS

BACKGROUND

- Former diammonium phosphate (DAP) fertilizer plant
- Bankruptcy and operations ended in 2014
 - Left more than 700 million gallons of low-pH, contaminated wastewater behind
- Environmental and Liquidation Trusts formed in 2015
- Environmental Trust became insolvent on Feb. 10, 2017
- EPA took control of wastewater treatment on Feb. 11, 2017
 - Now evaluating potential long-term treatment and closure options

MPC BANKRUPTCY: TWO TRUSTS

Environmental Trust

616 acres

Water treatment plant

Several ponds

East Gypsum Stack

West Gypsum Stack

Outfalls

Liquidation Trust

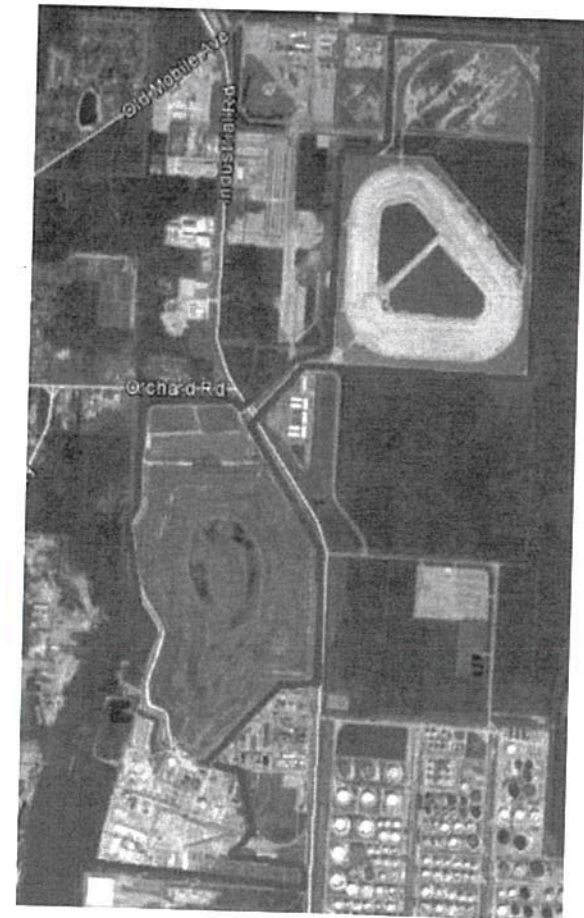
DAP plant

Ops buildings

Ammonia tank

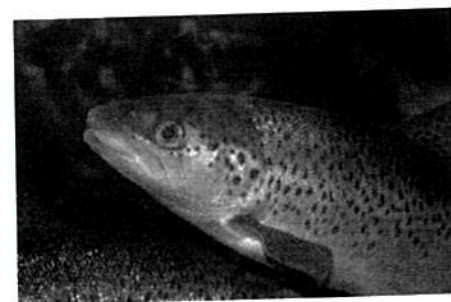
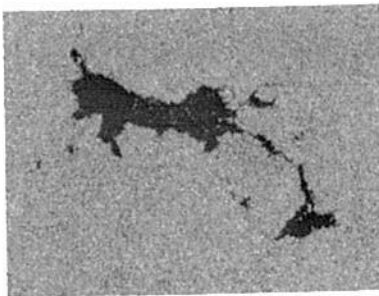
Sulfuric acid plant

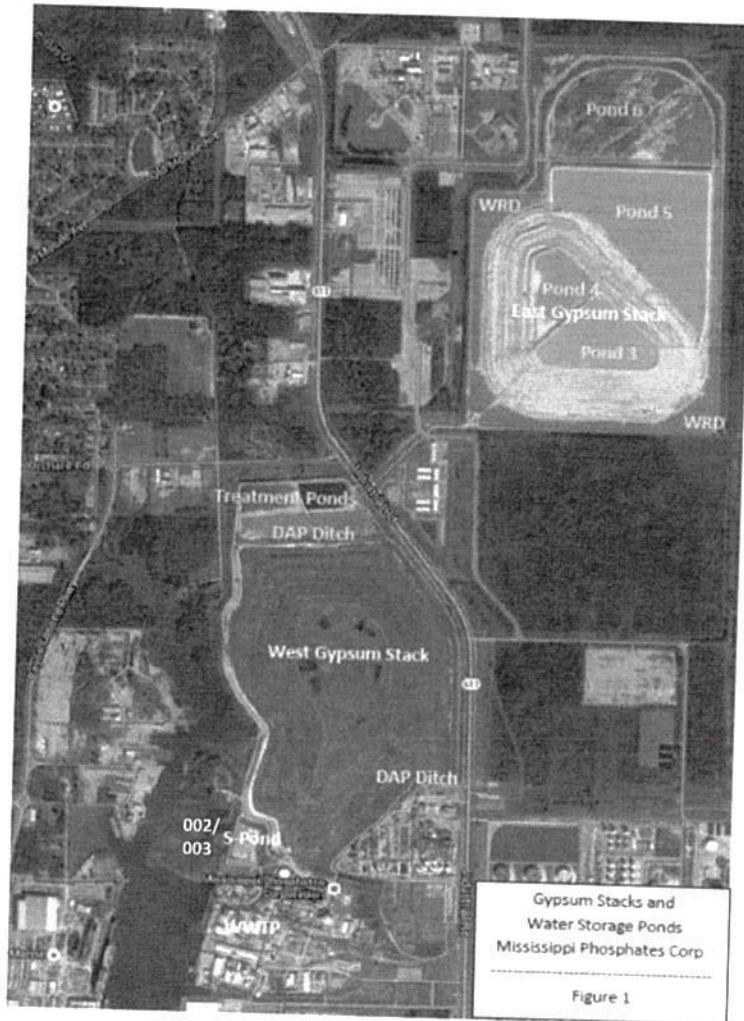
Dock



CURRENTLY

- EPA treats wastewater to neutralize the pH and remove high levels of nutrients to prevent:
 - An uncontrolled release to Bayou Casotte and the Grand Bay Estuary Reserve
 - Any acute toxicity impacts to aquatic wildlife
 - Formation of harmful algal blooms





POND CAPACITIES

- Water Return Ditch (WRD) – 130 MG
- Pond 3 – 100 MG
- Pond 4 – 25 MG
- Pond 5 – 200 MG
- Pond 6 – 130 MG
- North Ponds – 52 MG
- DAP Ditch – 91 MG
- S-Pond – 4 MG
- **TOTAL – 732 million gallons (MG)**

MPC WASTEWATER



- Wastewater is generated through precipitation runoff and percolation through the waste stacks
- 1 inch of rain = 9.1 million gallons of wastewater
- Facility must maintain 10.2 inches of surge capacity and 2.25 feet of site-wide freeboard
- Wastewater generated has a pH of 2.1 to 2.4, and also high levels of phosphate and ammonia
- Treatment occurs in the Waste Water Treatment (WWT) Plant and in-situ WWT process (WRD at Pond 6)

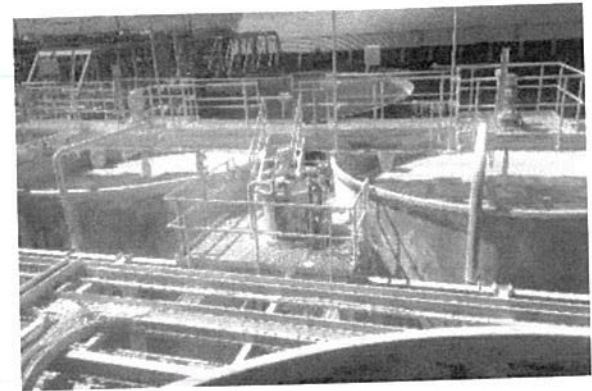
SURGE CAPACITY AND FREEBOARD

- **Surge Capacity** – amount of rainfall that the pond/ditch system can contain at any given time over the watershed of the system that does not impede into the safety freeboard
- **Freeboard** – measure of how full the pond/ditch system is at any given time; for instance, a 2-foot freeboard means that a pond is within 2 feet of being completely full – 2 feet from the top



WASTEWATER TREATMENT (MECHANICAL)

- Primary treatment method to add lime and polymer to the wastewater
- Addition of lime increases pH and allows for metals (calcium fluoride) and dissolved nutrients (phosphorous) to settle out of solution
- Treated water travels through the S-Pond to remove ammonia
- Treated water is then buffered again with sulfuric acid prior to discharge through NPDES-permitted outfall 003 through an underwater diffuser into Bayou Casotte



IN-SITU WASTEWATER TREATMENT PLANT

- Currently using WRD around Pond 6 as in-situ (in place) wastewater treatment plant (ISWWTP) cell
- Recycled lime from the WWTP used to treat ISWWTP wastewater
- Water is monitored during treatment process, then neutralized in Basin #002 and discharged into Bayou Casotte #003 pipe



EPA ON-SITE ACTIVITIES

Treat wastewater at minimum rate of 2 million gallons (mg) per day

- 1 to 1.5 mg from WWTP
- 0.5 to 1 mg from ISWWTP

Maintain required capacities

- 10.2 inches of surge
- 2.25 feet of freeboard
- Maintain integrity of Gypsum stacks, roads and berms



EPA PROPOSED NON-TIME-CRITICAL REMOVAL ACTION

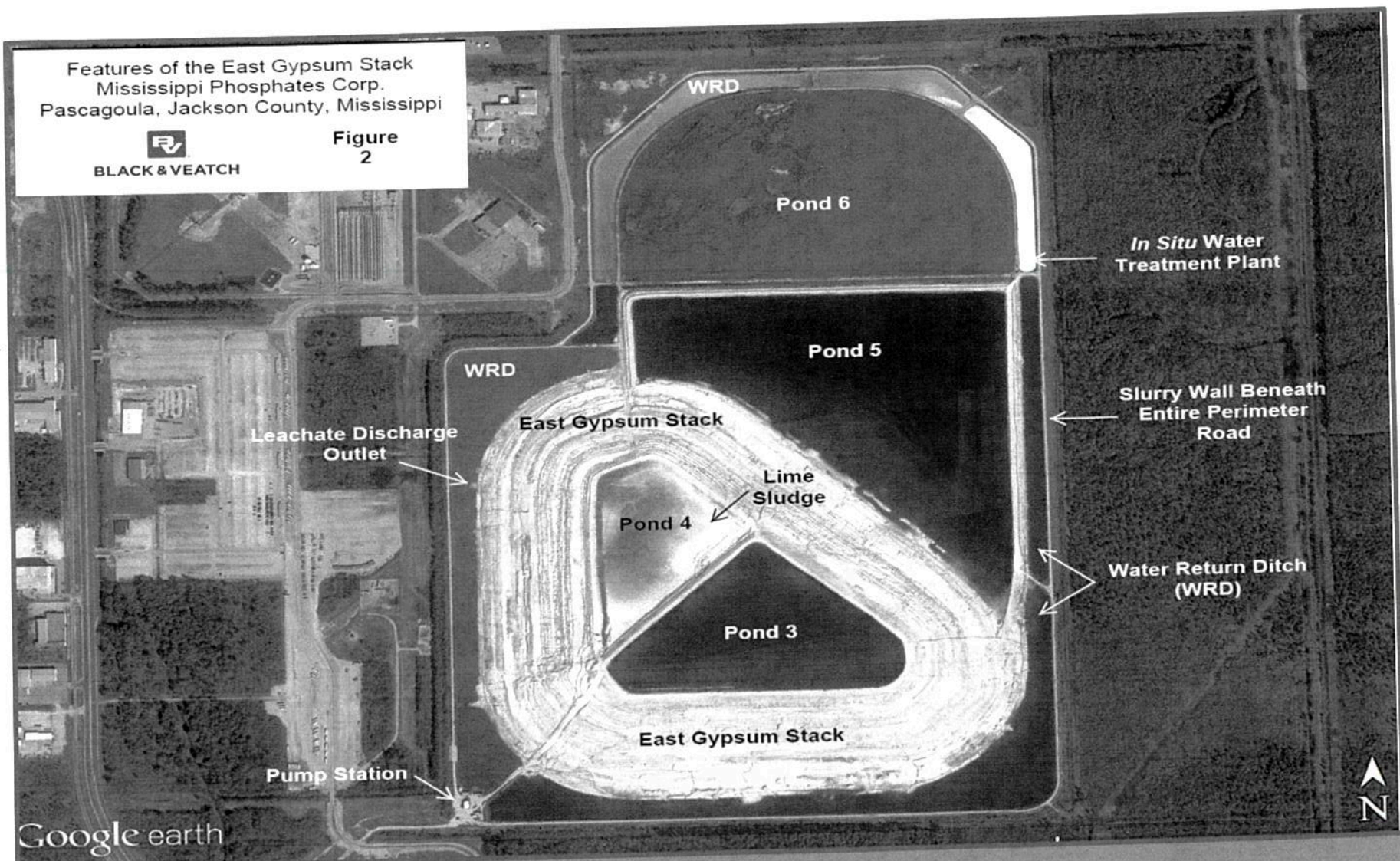
For closure of East Gypsum Stack and North Ponds at West Gypsum Stack

1. EPA prepared a cleanup plan
 - Engineering Evaluation/Cost Analysis (EE/CA)
 - Three proposed phases
2. EPA accepted public comments through February 10, 2018

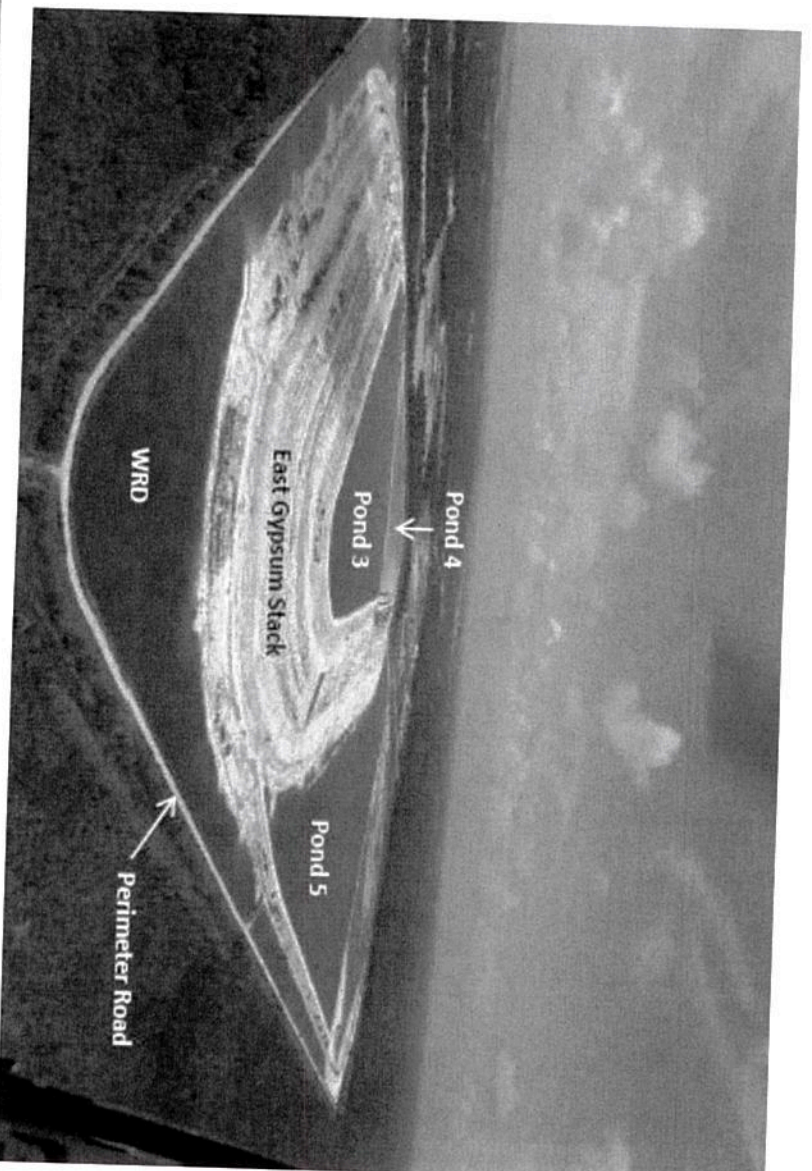
Features of the East Gypsum Stack
Mississippi Phosphates Corp.
Pascagoula, Jackson County, Mississippi



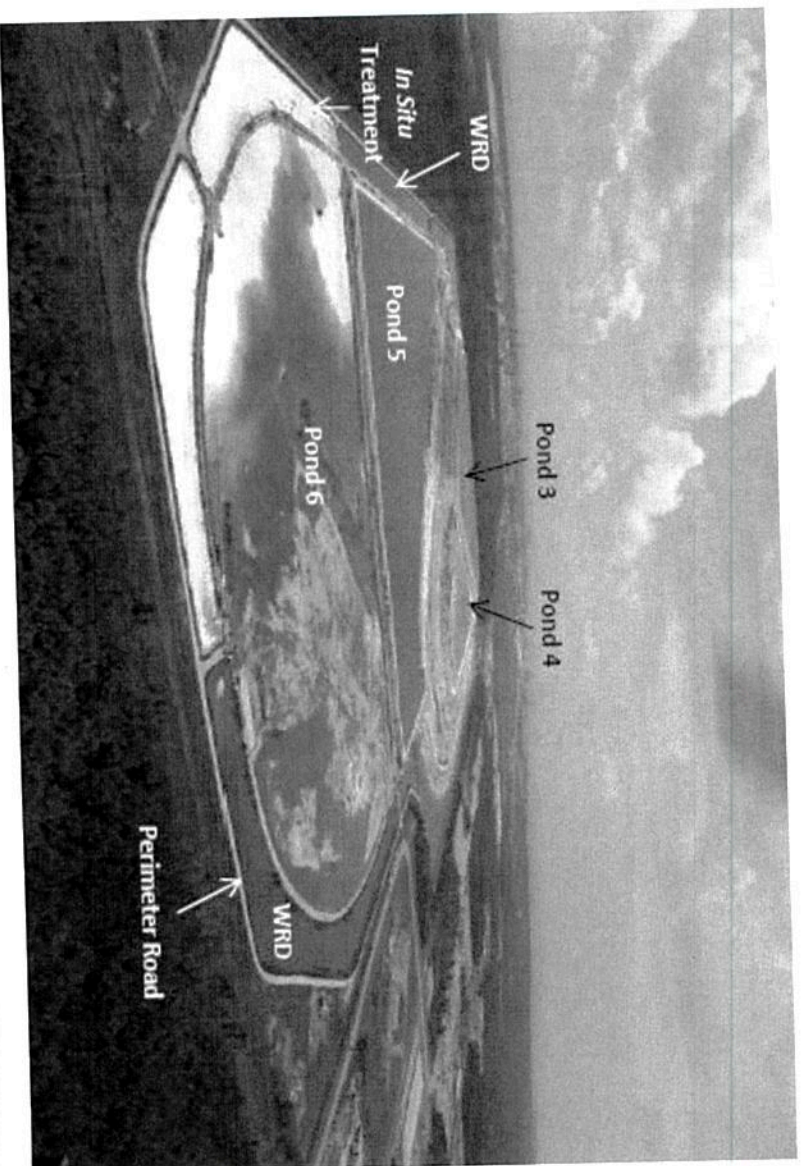
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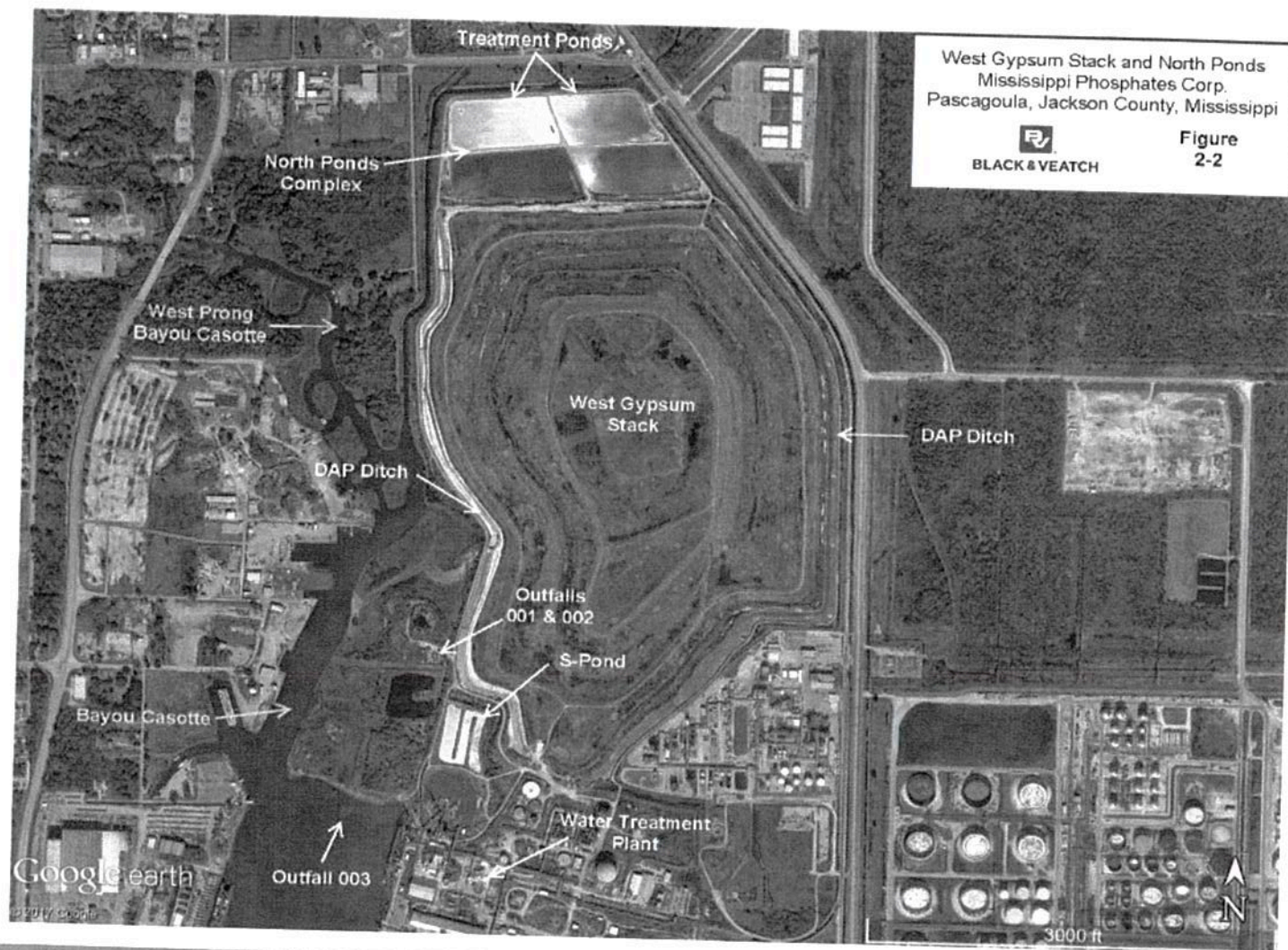


AERIAL VIEW OF EAST GYPSUM STACK



AERIAL VIEW OF EAST GYPSUM STACK





EPA'S PREFERRED CLEANUP PLAN

Phase 1 (2018) – Closure of current East Gypsum Stack, including Pond 3 and Pond 4 and stack-side slopes

- Close and grade Ponds 3 and 4
- Place polyethylene liner across crest, side slopes and benches
- Cover entire East Gypsum Stack with layer of protective soil and vegetated topsoil
- Collect stormwater on benches and route to Bayou Casotte
- Cost = \$31.4 million

EPA'S PREFERRED CLEANUP PLAN

Phase 2 (2019) – Closure of East Gypsum Stack Pond 5 and West Gypsum Stack North Ponds

- Drain, close and grade Pond 5 and cover with a polyethylene liner, a protective soil layer and vegetated topsoil
- Cover lime sludge in West Gypsum Stack North Ponds with reinforced geotextile, a protective soil layer (graded for drainage) and vegetated topsoil
- Route stormwater from both areas to Bayou Casotte
- Cost = \$18.4 million

EPA'S PREFERRED CLEANUP PLAN

Phase 3 (2020) – Closure of East Gypsum Stack Pond 6 and Water Return Ditch around perimeter of East Gypsum Stack

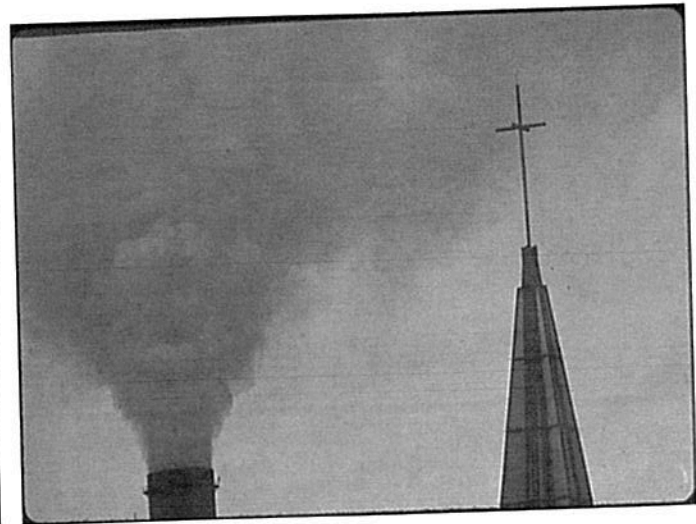
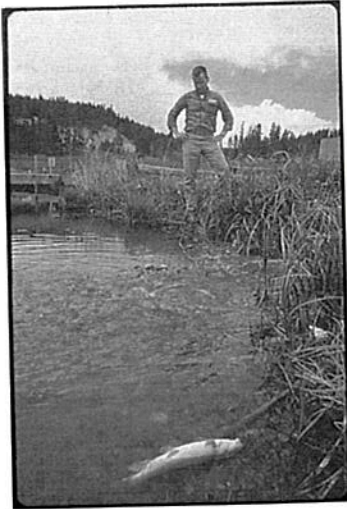
- Drain and grade Pond 6 and Water Return Ditch to promote drainage
- Cover footprint of Water Return Ditch with polyethylene liner, protective soil layer and vegetated topsoil
- Connect East Gypsum Stack underdrain to perimeter collection system connected to mechanical WWT plant
- Cover footprint of Pond 6 with protective soil layer and vegetated topsoil
- Route stormwater from both areas to Bayou Casotte
- Cost = \$21.8 million



WHAT IS SUPERFUND?

WHAT IS SUPERFUND?

- Since 1980, EPA's Superfund program has been responsible for cleaning up some of the nation's most contaminated land and responding to environmental emergencies, oil spills and natural disasters



SUPERFUND HISTORY

CERCLA (Superfund)

- Comprehensive Environmental Response, Compensation, and Liability Act, as amended
- A law passed in 1980 by Congress to address the dangers of abandoned or uncontrolled hazardous waste dumps by developing a nationwide program for:
 - Emergency response
 - Information gathering and analysis
 - Liability for responsible parties
 - Site cleanup



SUPERFUND HISTORY

- National Oil and Hazardous Substances Pollution Contingency Plan (NCP)
 - The implementing regulations for CERCLA
 - Sets forth procedures that must be followed by EPA and private parties during emergency responses and cleanups

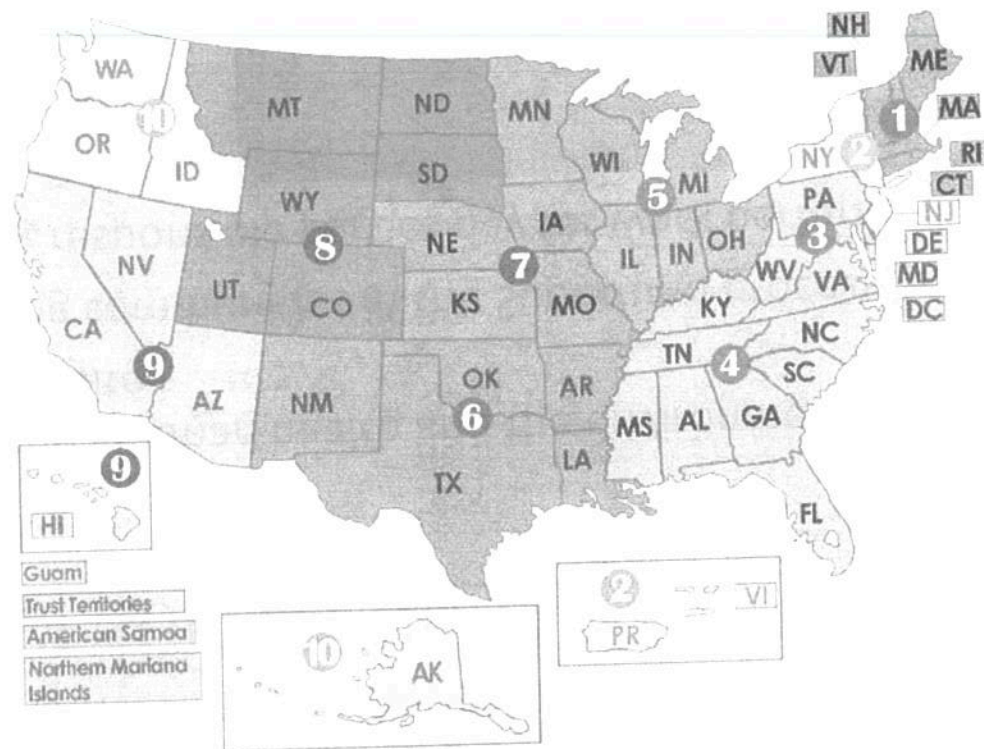


GOALS OF SUPERFUND

- Includes:
 - Protecting human health and the environment by cleaning up polluted sites
 - Involving communities in the Superfund process
 - Making responsible parties pay for work performed at Superfund sites

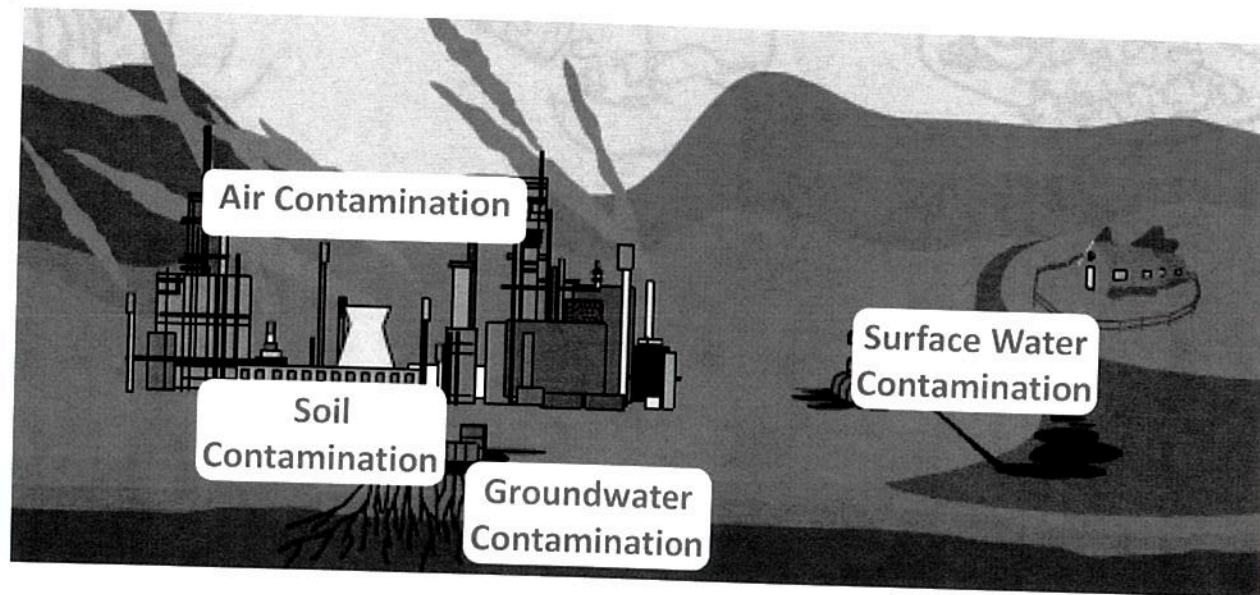


IMPLEMENTATION OF SUPERFUND



HAZARDOUS WASTE CONCERNS

- Superfund was enacted in response to growing concerns over the health and environmental risks posed by hazardous waste sites



HAZARDOUS WASTE CONCERNS – POTENTIAL HUMAN EXPOSURE



Inhalation
(through breathing)



Ingestion
(through eating/drinking)

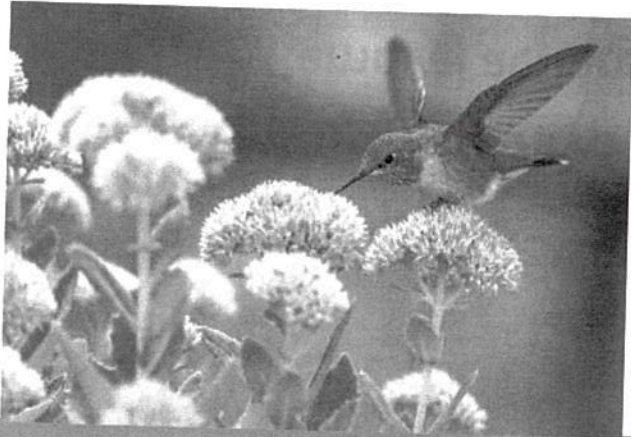
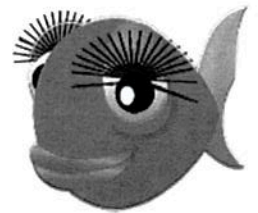


Direct Contact
(through skin or eye contact)

Illustrations: Skeo

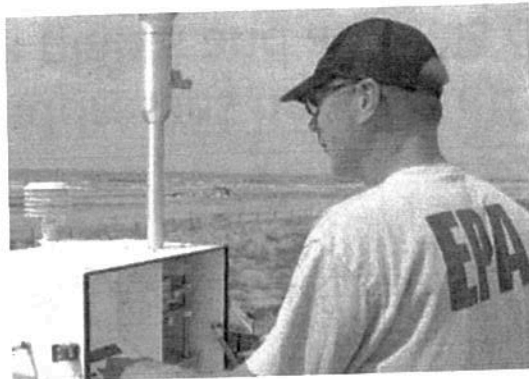
HAZARDOUS WASTE CONCERNS – POTENTIAL HARM TO THE ENVIRONMENT

- Superfund also addresses harmful effects of site contaminants on plants and animals of concern



TYPES OF RESPONSES

- EPA uses two types of response to address polluted sites:
 - **Removal actions:** for emergency oil spills or chemical releases and short-term responses
 - **Remedial actions:** for complex sites needing long-term responses



REMOVAL ACTIONS

- **Emergency Removal Actions:** These include hazardous waste spills that require immediate attention

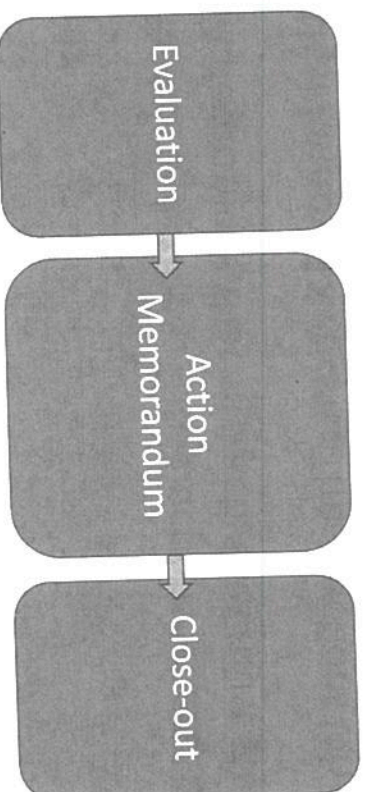
These limited, short-term response actions address situations such as:

- Tanker spills
- Leaking drums

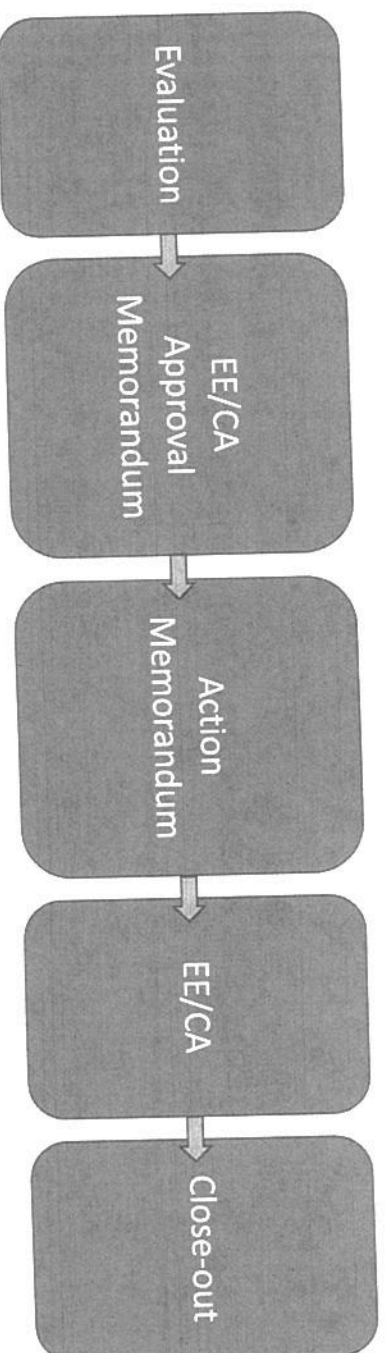
- **Time-Critical Removal Actions:** Those actions where, based on a site evaluation, EPA determines that site activities must start within six months
- **Non-Time-Critical Removal Actions:** Those actions where, based on a site evaluation, EPA determines that planning will require more than six months

THE SUPERFUND REMOVAL PROCESSES

Time-Critical Removal



Non-Time-Critical Removal

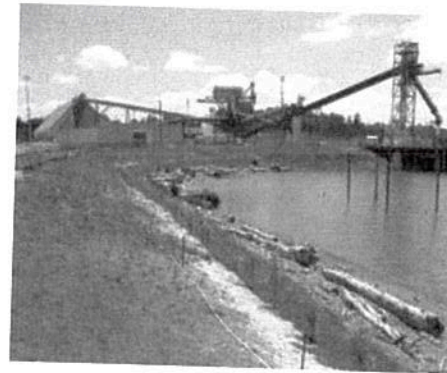


REMEDIAL ACTIONS

- Actions that manage releases that do not pose an urgent threat to public health or the environment and do not require immediate action
- Remedial actions involve complex and highly contaminated sites that often require several years to study the problem, develop a permanent solution and clean up the hazardous waste



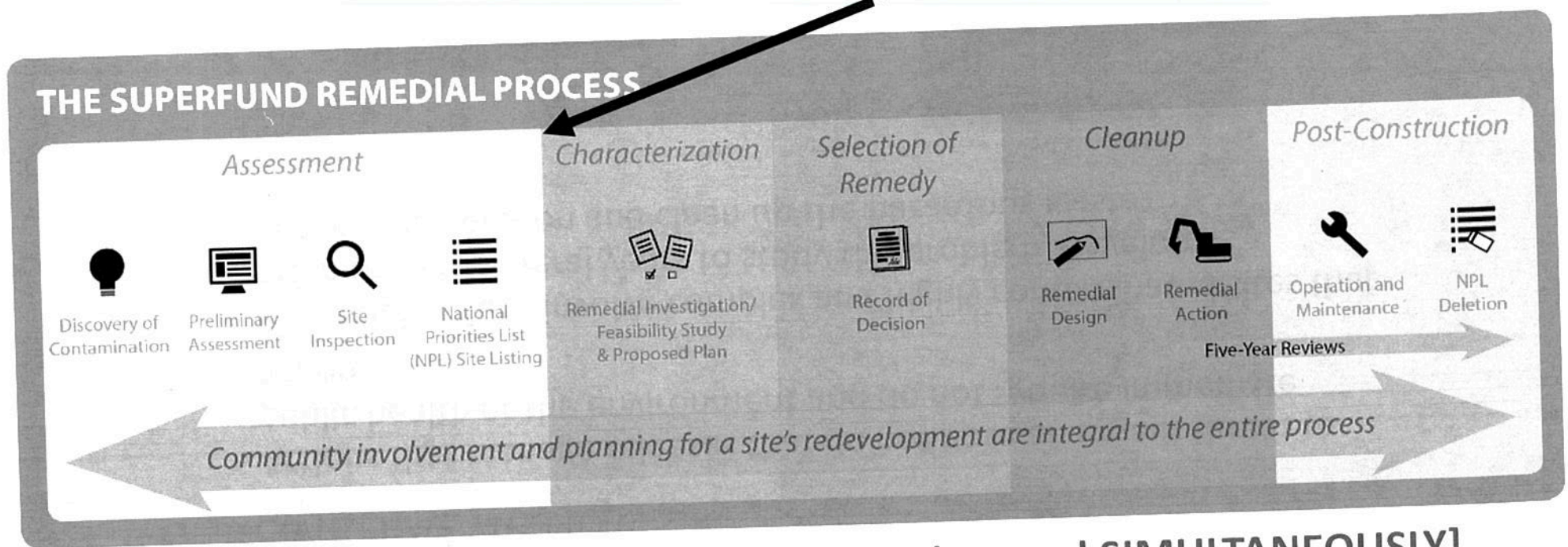
Before



After

THE SUPERFUND REMEDIAL PROCESS

You are here



[NOTE: removal actions can occur at any time and SIMULTANEOUSLY]

COMMUNITY INVOLVEMENT

- Communities have a voice during all phases
- Communities are provided with:
 - Educational materials
 - Outreach activities
 - Site information
 - Training
 - Technical assistance
 - Other support
- Required public comment periods occur after:

Removal Remedial Action

- NPL Listing is proposed
- Proposed Plan is published
- Notice of Intent to Delete from the NPL is published
- Time-Critical Removal Action is proposed, if appropriate
- EE/CA is published

COMMUNITY INVOLVEMENT GOALS

- Keep communities informed of site activities
- Provide opportunities for public comment
- Address community issues
- Improve environmental education
- Provide training opportunities
- Create partnerships with academic institutions



THE SUPERFUND REMEDIAL PROCESS

THE SUPERFUND REMEDIAL PROCESS

You are here

THE SUPERFUND REMEDIAL PROCESS

Assessment



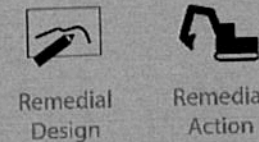
Characterization



Selection of Remedy



Cleanup



Post-Construction



Five-Year Reviews

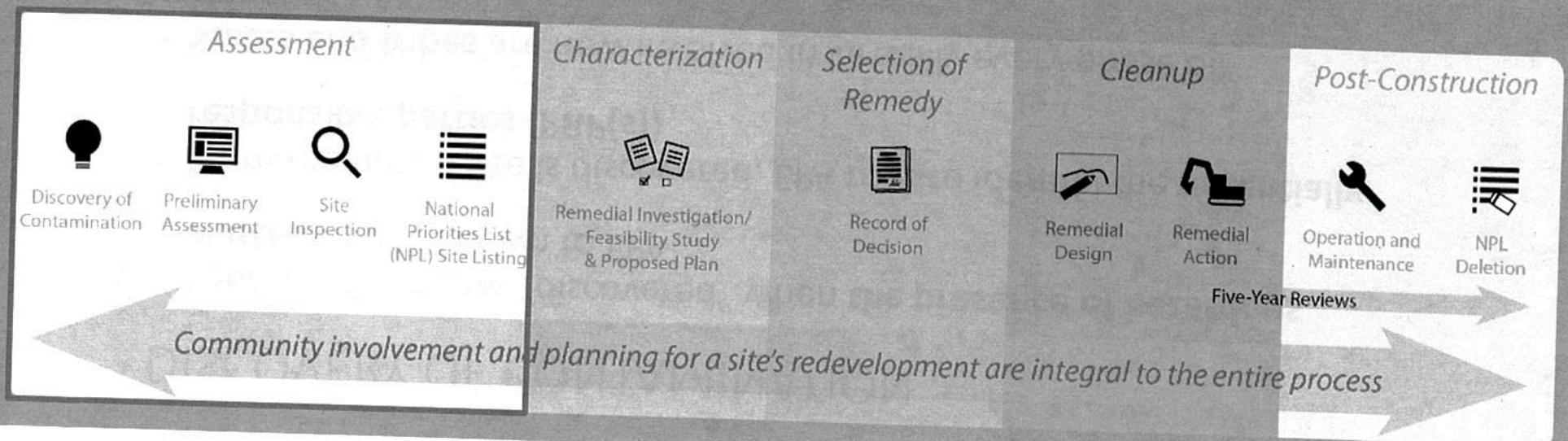
Community involvement and planning for a site's redevelopment are integral to the entire process

[NOTE: removal actions can occur at any time and SIMULTANEOUSLY]

ASSESSMENT

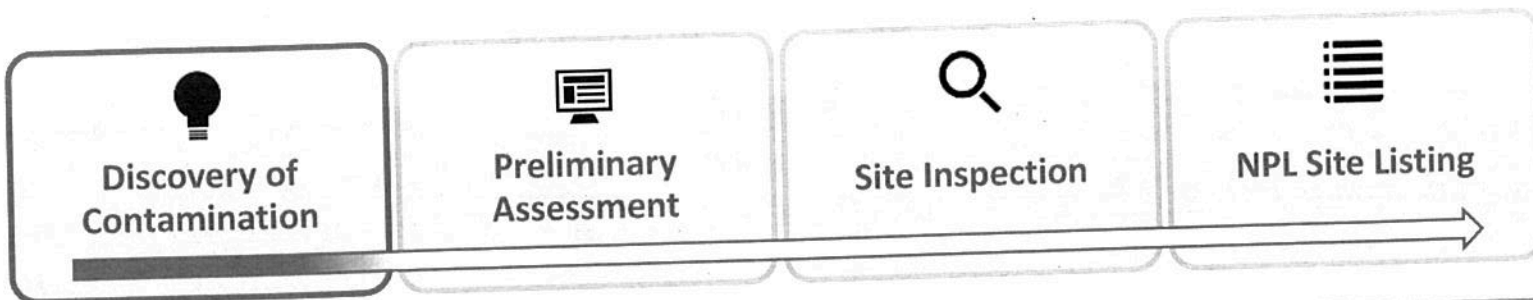
- What happens when a polluted site is discovered?

THE SUPERFUND REMEDIAL PROCESS



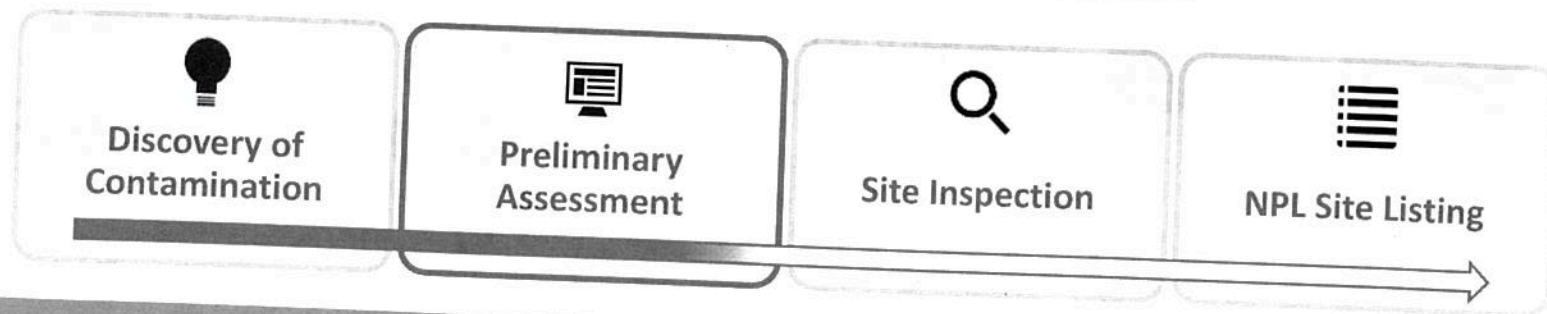
DISCOVERY OF CONTAMINATION

- Superfund sites are “discovered” when **the presence of hazardous waste** is made known to EPA
- From the time a site is discovered, EPA tries to identify the **potentially responsible parties (PRP(s))**
- **States and tribes** are now involved in virtually every phase of cleanups



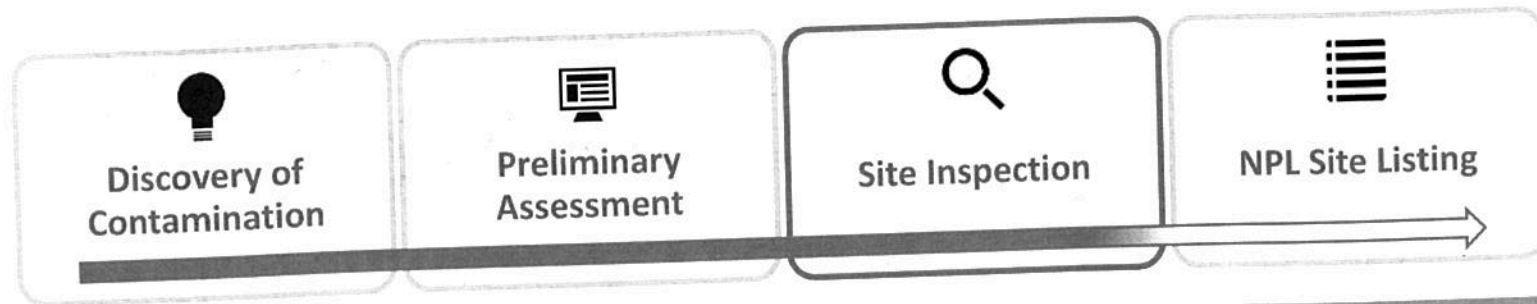
PRELIMINARY ASSESSMENT (PA)

- A **Preliminary Assessment** is limited in scope
- EPA looks at existing information, and may interview nearby residents
- EPA uses this information to determine if a site requires further investigation



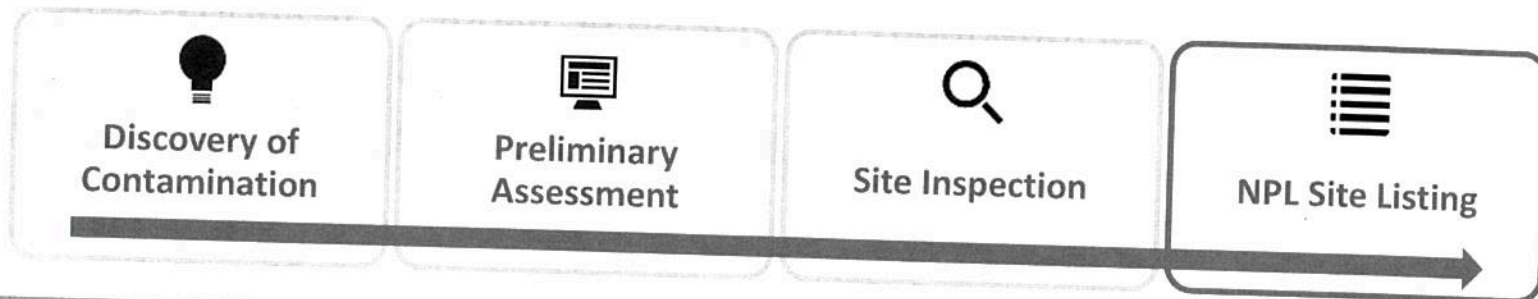
SITE INSPECTION (SI)

- A **Site Inspection** builds on information gathered during the PA
- A site inspection may involve sampling at the site



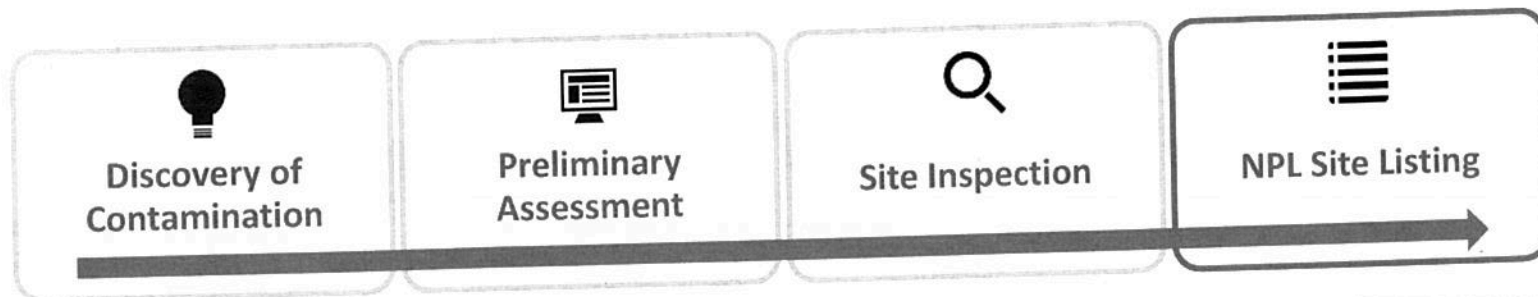
HAZARD RANKING SYSTEM (HRS)

- The HRS uses PA/SI data and compares that to a set of criteria to arrive at a numerical score
- The criteria are:
 - Amount and toxicity of the contaminant
 - Potential for pollution to spread
 - Threat of soil exposure or migration to surface water, groundwater and air
 - Risk to human health and the environment



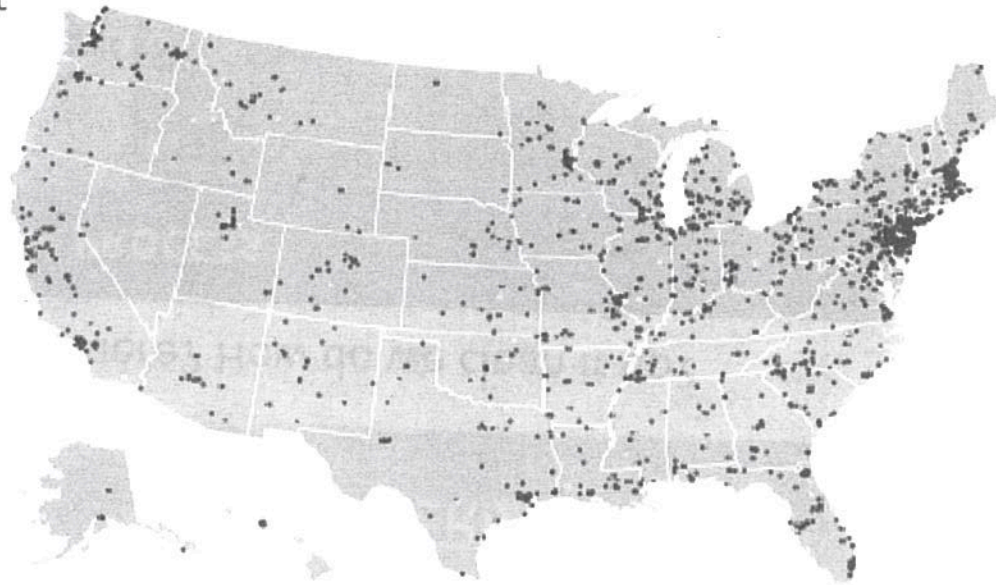
HAZARD RANKING SYSTEM

- Sites scoring at or above an established regulatory level are proposed for listing on the NPL
 - The proposed listing is published in the Federal Register
 - 60-day public comment period



NATIONAL PRIORITIES LIST

- Once on the NPL, a site can receive Superfund money for cleanup
- The sites with the highest scores are not necessarily completed or funded first

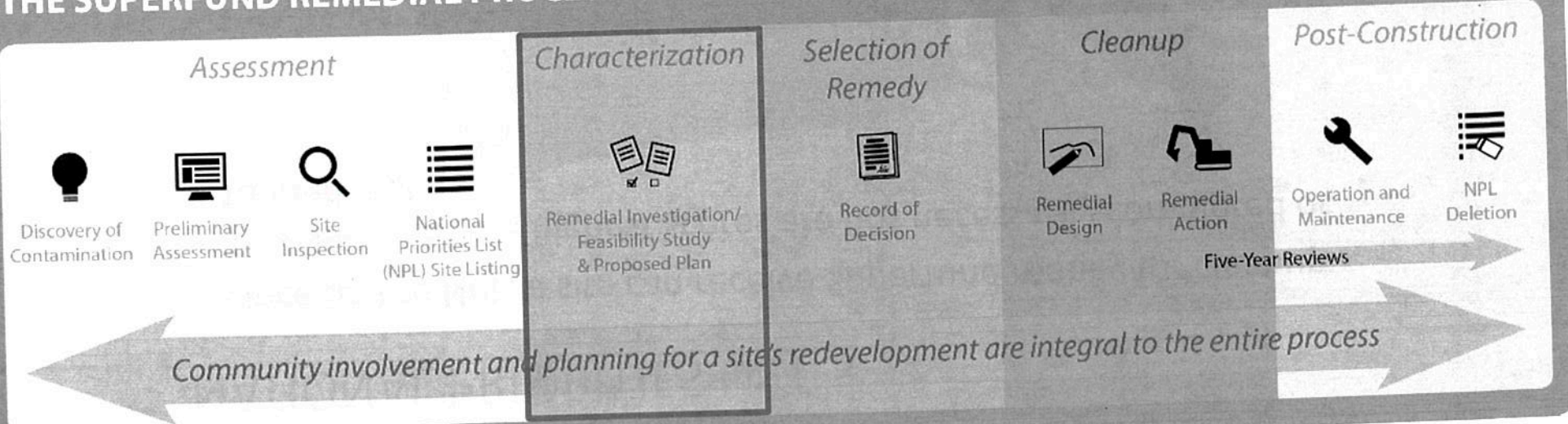


By skew-t (Own work) [CC BY-SA 3.0](#), via Wikimedia Commons

CHARACTERIZATION

- How much contamination is there? How do we clean it up?

THE SUPERFUND REMEDIAL PROCESS



REMEDIAL INVESTIGATION (RI)

- The goal of the **Remedial Investigation** is to determine the extent of contamination and potential risks
 - Samples soil, surface water, groundwater, and waste from locations across the site and near site boundaries
 - Assesses risks posed by the site

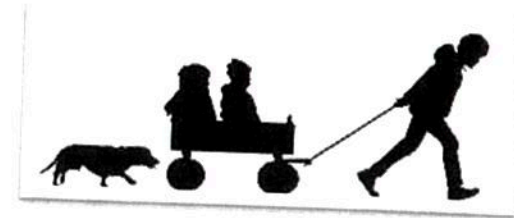
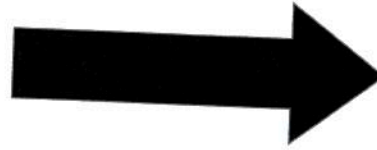
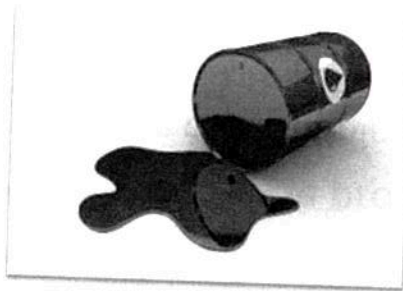


Remedial Investigation/Feasibility Study & Proposed Plan

WHAT IS RISK ASSESSMENT?

- Science-based site-specific estimate of the human health risk faced by a population exposed to site contaminants
- Estimates **current and possible future risks**, if no cleanup actions taken
- Helps EPA select the best cleanup strategies to **manage risks to acceptable levels**

RISK HAPPENS WHEN ...



1. Contaminants exist
2. Concentrations are high enough

3. There is an exposure pathway

4. There are receptors (people, animals, a sensitive ecosystem)

RISK ASSESSMENT

- Does contamination pose unacceptable human and/or ecological health risks?
 - Based on detailed EPA and State risk assessment guidance documents
 - Uses step-wise process to estimate cancer and noncancer risks based on:
 - Type of contaminants/hazards
 - Potential for exposure to contaminants

RISK ASSESSMENT

- Most samples from hazardous waste sites are analyzed for 103 **target compounds and analytes** recommended by EPA's Superfund program
- While EPA considers it necessary to gather information on many contaminants, **baseline risk assessments are dominated by a few contaminants and a few routes of exposure at most sites**

FEASIBILITY STUDY (FS)

- The analysis of potential treatment methods or “cleanup alternatives” is called a **Feasibility Study**
- During the FS, the pros and cons of each cleanup method are explored in relation to the nine NCP criteria
- Based on results of the FS, EPA will develop a Proposed Plan for site cleanup



Remedial Investigation/Feasibility Study & Proposed Plan

REMEDY SELECTION

- Proposed Plan
 - EPA identifies the preferred remedy
 - EPA gathers public input through a formal comment period
 - EPA responds to comments received in responsiveness summary



Remedial Investigation/Feasibility Study & Proposed Plan

NINE EVALUATION CRITERIA

1. Protection of Human Health and the Environment
2. Compliance with State and Federal Requirements

Threshold Criteria

3. Long-term Effectiveness and Permanence
4. Reduction of Toxicity, Mobility, or Volume through Treatment
5. Short-term Effectiveness
6. Implementability
7. Cost

Balancing Criteria

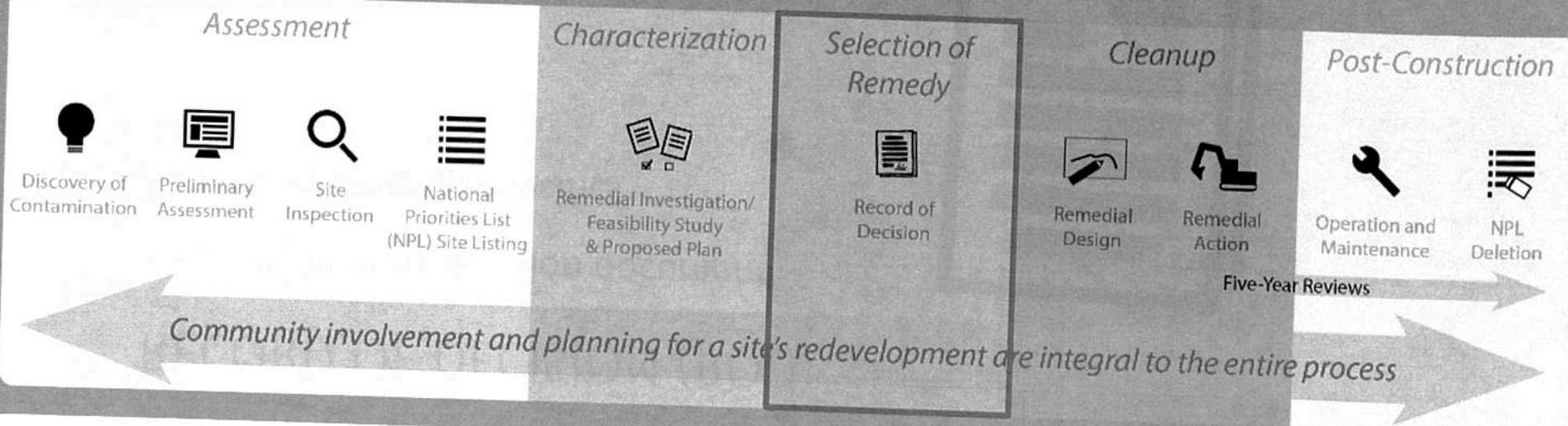
8. State Acceptance
9. Community Acceptance

Modifying Criteria

SELECTION OF REMEDY

- What happens after evaluation of cleanup options and public comment?

THE SUPERFUND REMEDIAL PROCESS



RECORD OF DECISION (ROD)

- Legally binding decision document
- Outlines cleanup specifics

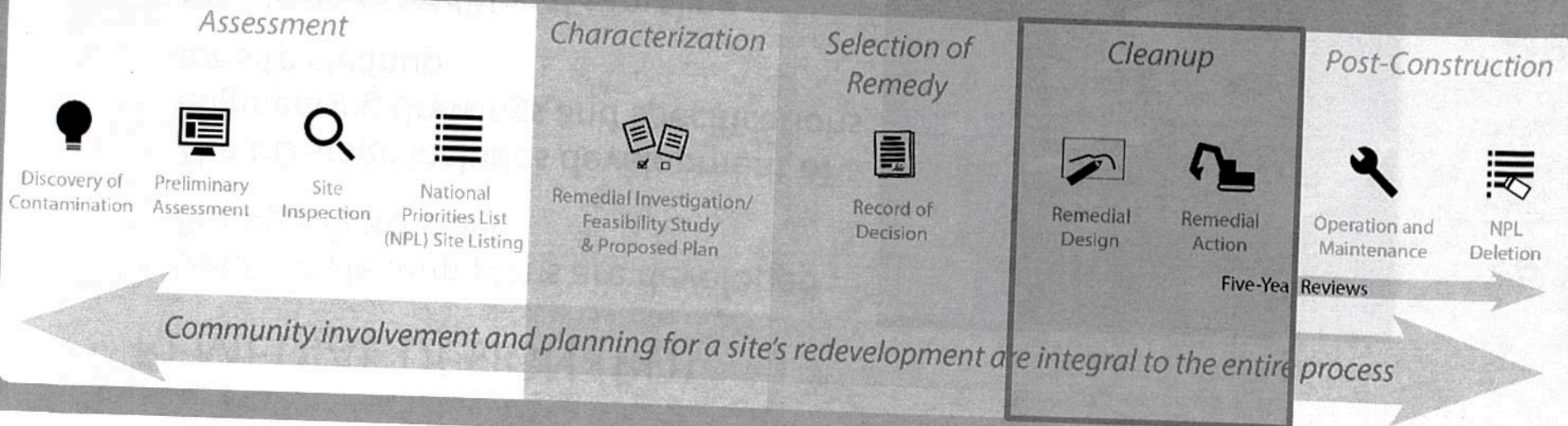


Record of Decision

CLEANUP

- What happens after remedy selection?

THE SUPERFUND REMEDIAL PROCESS

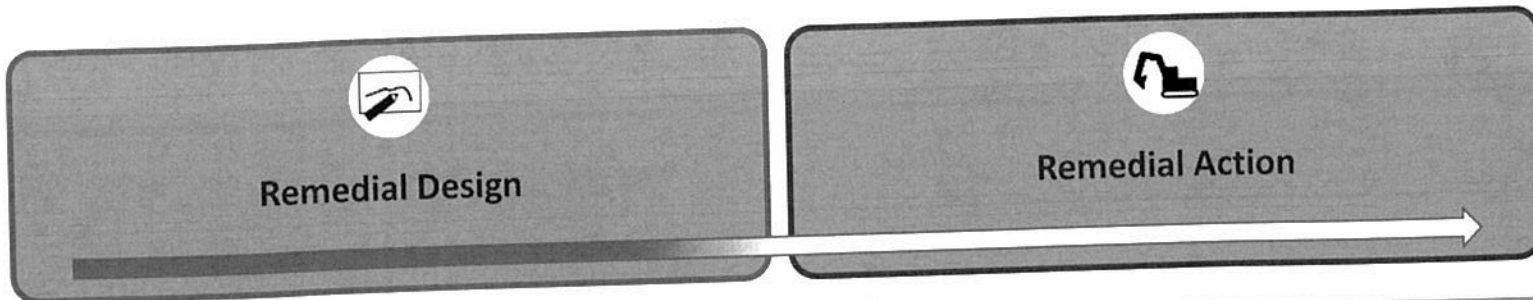


REMEDIAL DESIGN (RD)

- Detailed cleanup plans are developed during the RD stage
- The RD stage includes development of engineering drawings and specifications for site cleanup
- May include additional sampling

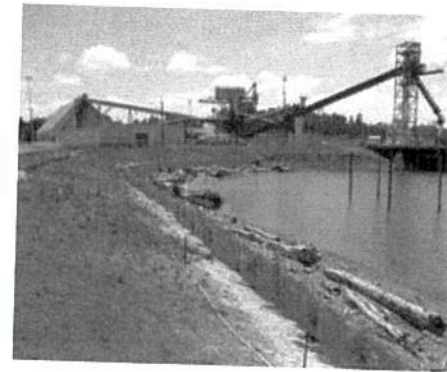
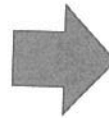


Source: EPA



REMEDIAL ACTION

- Remedial action follows RD; it is the construction and implementation phase of site cleanup



Remedial Design



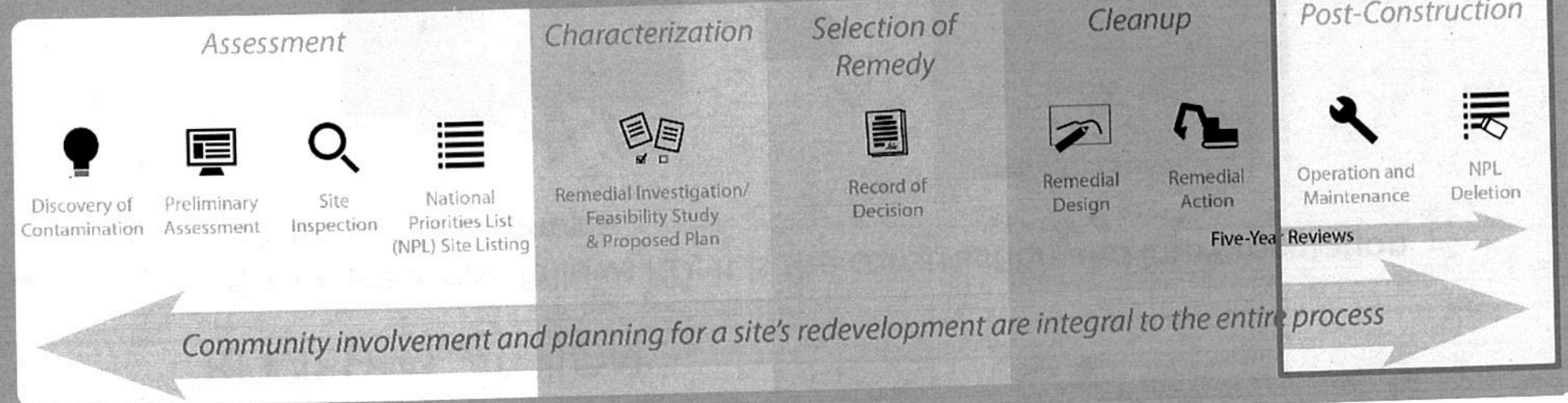
Remedial Action



POST-CONSTRUCTION

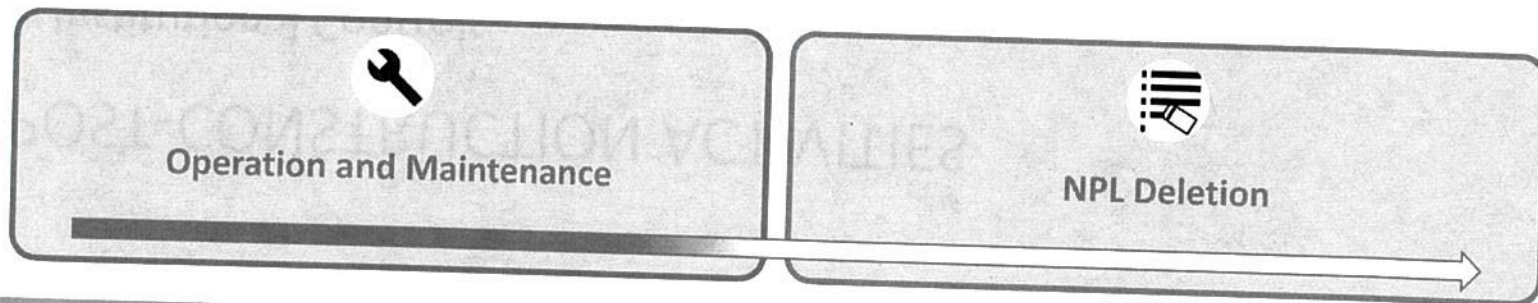
- What happens after cleanup?

THE SUPERFUND REMEDIAL PROCESS



OPERATION AND MAINTENANCE

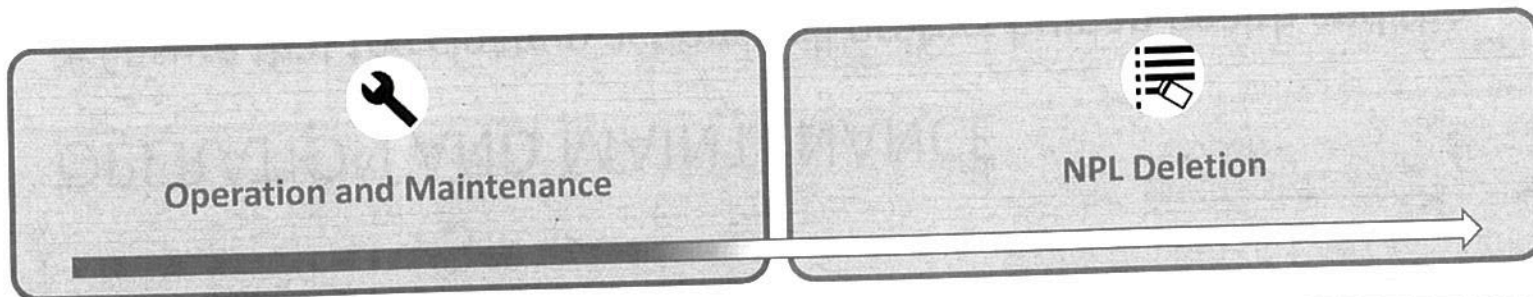
- Ensure that the cleanup actions will protect human health and the environment over the long term
- May include routine maintenance
 - Keeping signs and fences intact
 - Inspecting and maintaining soil covers



POST-CONSTRUCTION ACTIVITIES

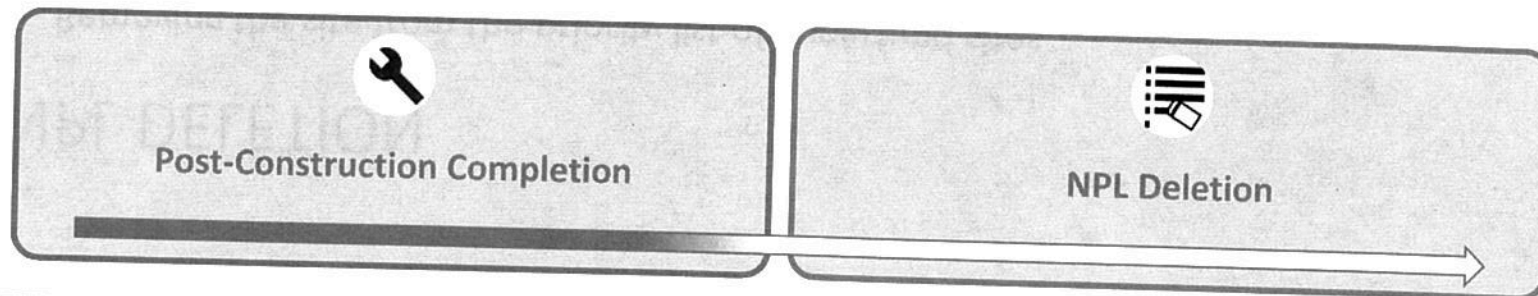
- Institutional Controls

- Non-engineered instruments that help keep people from being exposed to contamination
- Examples include zoning restrictions to prevent residential use of land, local ordinances to prevent installation of drinking water wells, and deed notices to alert future owners of property restrictions such as not disturbing a soil cap



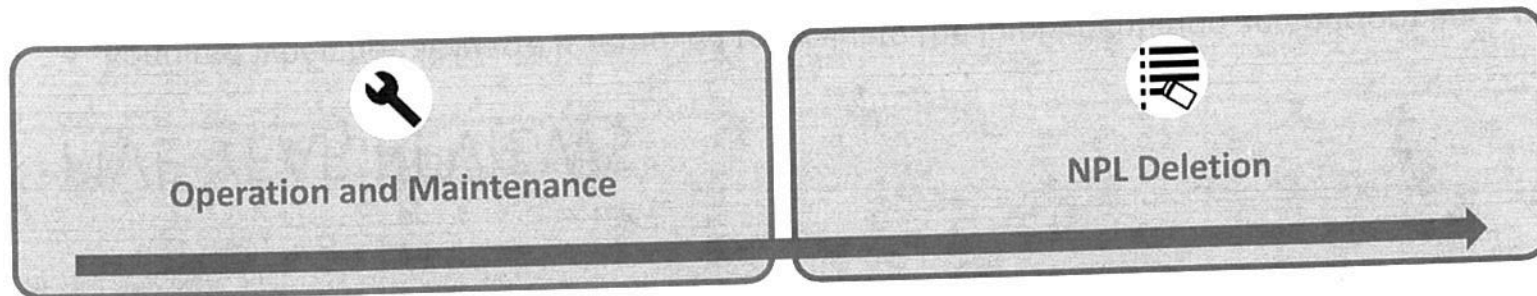
FIVE-YEAR REVIEWS

- Required when not all waste is removed to evaluate the implementation and performance of a remedy to determine whether it remains effective
- A Five-Year Review may include:
 - Examining site data
 - Inspecting the site
 - Taking new samples
 - Talking with affected residents about site conditions, problems or concerns
- EPA must notify the community and other interested parties when a Five-Year Review will be conducted at a site



NPL DELETION

- Removing the site from the priority list of Superfund sites
- EPA notifies the community of the availability of an **Intention to Delete** for comment
- EPA then accepts comments from the public on the information presented in the notice and issues a Responsiveness Summary to formally respond to public comments received
- If, after the formal comment period, the site still qualifies for deletion, EPA publishes a formal deletion notice





SUPERFUND COMMUNITY INVOLVEMENT PROGRAMS

SUPERFUND COMMUNITY INVOLVEMENT PROGRAMS OVERVIEW

GENERAL INFORMATION

- Superfund Community Involvement
- Technical Assistance Overview

TECHNICAL ASSISTANCE OPPORTUNITIES

- Technical Assistance Needs Assessments (TANAs)
- Community Advisory Groups (CAGs)
- Technical Assistance Grants (TAGs)
- Technical Assistance Services for Communities (TASC) Program
- Conflict Prevention and Resolution Services (CPRS)



SUPERFUND COMMUNITY INVOLVEMENT



- People should have a say in decisions that affect their lives
- People have important information that can inform decision-making
- Community involvement results in better outcomes for everyone



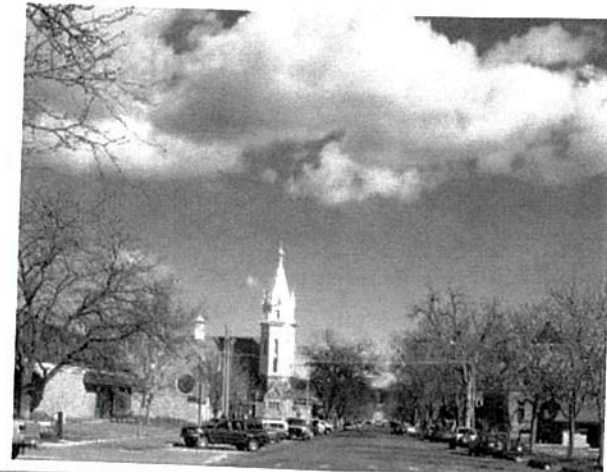
SUPERFUND TECHNICAL ASSISTANCE

- To help people better understand technical issues related to Superfund site investigations and cleanup
- With this assistance, communities are then in a better position to share their concerns and priorities with EPA
- A variety of technical assistance opportunities are available to the community

GETTING STARTED: TECHNICAL ASSISTANCE NEEDS ASSESSMENTS

- Process to identify whether a community requires additional support:
 - Understanding technical information
 - Meaningfully participating in the Superfund process
- Can be conducted by EPA site team or contractor
- Informed by discussions with community members
- Results: prioritized list of technical needs and recommendations for ways to meet needs

How to request: community discussions with EPA site team



AVAILABLE OPPORTUNITIES: COMMUNITY ADVISORY GROUPS (CAGs)

- Forum for community discussion
- CAG advises EPA on community concerns and recommendations
- Can be formed anytime during cleanup process
- May not be appropriate for every site
- EPA can help with group formation, or evaluate if an existing broad-based group might function as a CAG

How to request: community discussions with EPA site team



COMMUNITY ADVISORY GROUPS (CAGs): *CAG CREATION*

- CAG information meeting to introduce CAG concept to the community
- News releases and information sharing to get the word out
- Goal is fully operational CAG within six months of initial meeting
- EPA can assist community with determining CAG size and membership



COMMUNITY ADVISORY GROUPS (CAGs): *CAG CONSIDERATIONS*

- *Membership:* The CAG should reflect the composition of the community near the site and the diversity of racial, ethnic and economic interests in the community
- *Size:* typically 12 to 15 members
- *Selection Method:* Because each community is unique, membership selection methods will vary; key is ensuring that the CAG will be fully representative of the community and will function effectively as a group

COMMUNITY ADVISORY GROUPS (CAGs): *CAG MEMBER TRAINING AND RESPONSIBILITIES*

- *Training:*

CAG members may require initial training to enable them to perform their duties; EPA works with agencies, local governments and others to provide training, prepare briefing materials and conduct site tours for new CAGs

- *Responsibilities:*

Participate in CAG meetings, provide feedback to EPA on site issues, share information with fellow community members

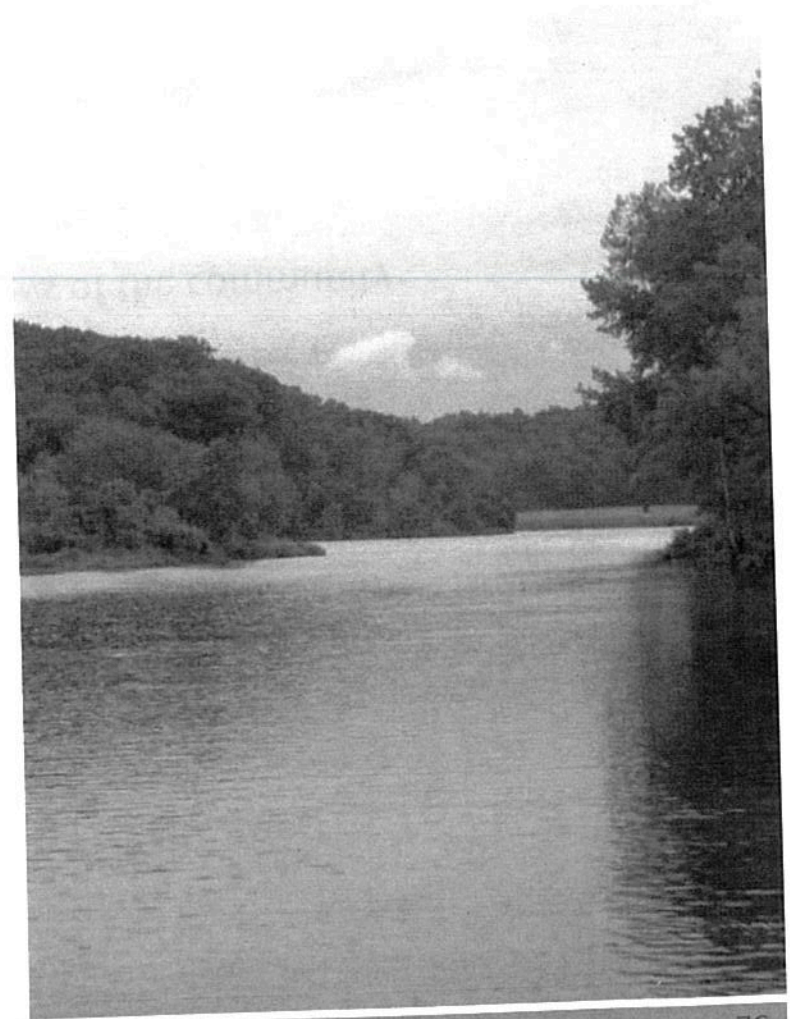
Must be prepared to fairly and honestly represent the views of the community members they represent as well as their own views

- *Management:*

CAG chairperson often selected to guide CAG meetings for set period

COMMUNITY ADVISORY GROUPS (CAGs): *CAG OPERATIONS*

- *Initial Activities:*
Mission statement, set of procedures to guide day-to-day operations
- *CAG Meetings:*
Open to the public, meeting details and format based on site and community needs
- *EPA Assistance:*
Administrative support, translation and meeting facilitation services



AVAILABLE OPPORTUNITIES:
TECHNICAL ASSISTANCE GRANTS (TAGs)



- An eligible group (incorporated) applies to EPA for grant money to fund group-chosen technical advisor
- Initial grant up to \$50,000
- Technical advisor assists the group in understanding cleanup
- Group provides grant administration

How to request: community discussions with EPA site team

AVAILABLE OPPORTUNITIES:
TECHNICAL ASSISTANCE GRANTS (TAGs)



- Communities contract with their technical advisors
- Best for communities that can handle grant administration
- Best for communities that want to choose their advisor
- For longer-term needs

AVAILABLE OPPORTUNITIES: TECHNICAL ASSISTANCE GRANTS (TAGs)



Application Process

- Follows TAG and federal grant regulations, and EPA grant policies
- Group meets minimum eligibility requirements
- Letter of intent (LOI) and federal grant application package
- Applications reviewed by EPA staff (site team, TAG coordinator, grant specialist)
- Award recommended by program and finalized by regional grants office
- Generally 90 days or more from LOI to award



AVAILABLE OPPORTUNITIES: TECHNICAL ASSISTANCE SERVICES FOR COMMUNITIES (TASC) PROGRAM

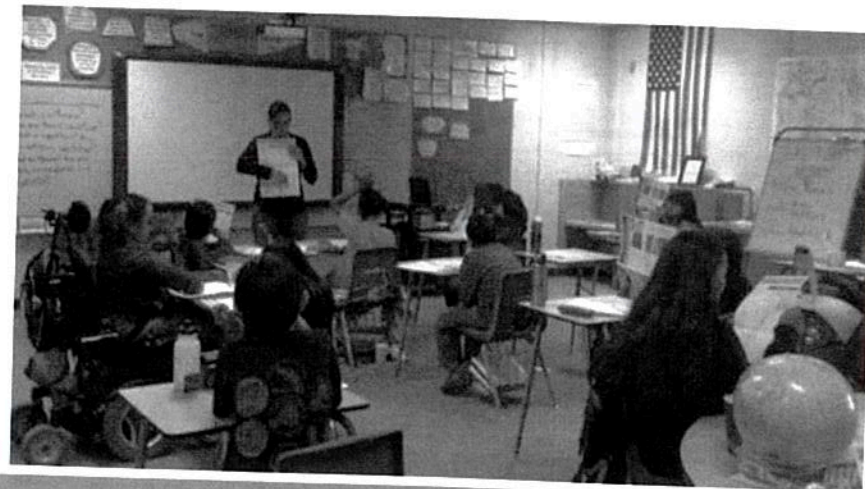
- Independent, non-advocacy assistance
- Range of services
- No costs or administration responsibilities for community
- TASC provides services through national EPA contract




How to request: community discussions with EPA site team

AVAILABLE OPPORTUNITIES: TASC PROGRAM SERVICES

- Community trainings
- Reviews and explanations of technical information
- Educational presentations
- Technical Assistance Needs Assessments (TANAs)
- CAG formation support
- Meeting facilitation
- Outreach materials
- Superfund Job Training Initiative (SuperJTI)



EXAMPLES OF TASC PRODUCTS



Technical Assistance Services for Communities West Lake Landfill Superfund Site Fact Sheet - June 2015

TASC Summary - 1.000111
Location at Henderson 1.000111

The site is located in Henderson, Nevada, near the intersection of Highway 95 and Highway 15. The site is a former landfill and is currently used for storage of materials. The site is owned by the Nevada Department of Transportation (NDOT).

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West Lake Landfill

West Lake Landfill is a Superfund site located in Henderson, Nevada. The site is a former landfill and is currently used for storage of materials. The site is owned by the Nevada Department of Transportation (NDOT).

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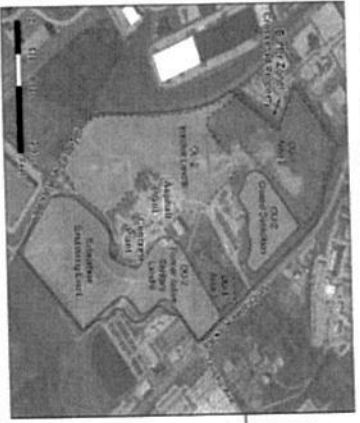


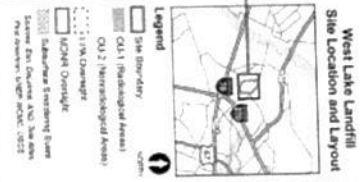
West Lake Landfill Site Location and Layout

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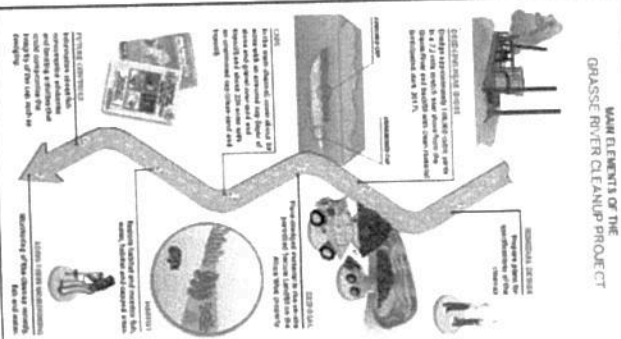


MAIN ELEMENTS OF THE GRASSIE RIVER CLEANUP PROJECT

The project is a cleanup of the Grassie River, which is a tributary of the Colorado River. The project is located in the state of Colorado. The project is owned by the Colorado Department of Transportation (CDOT).

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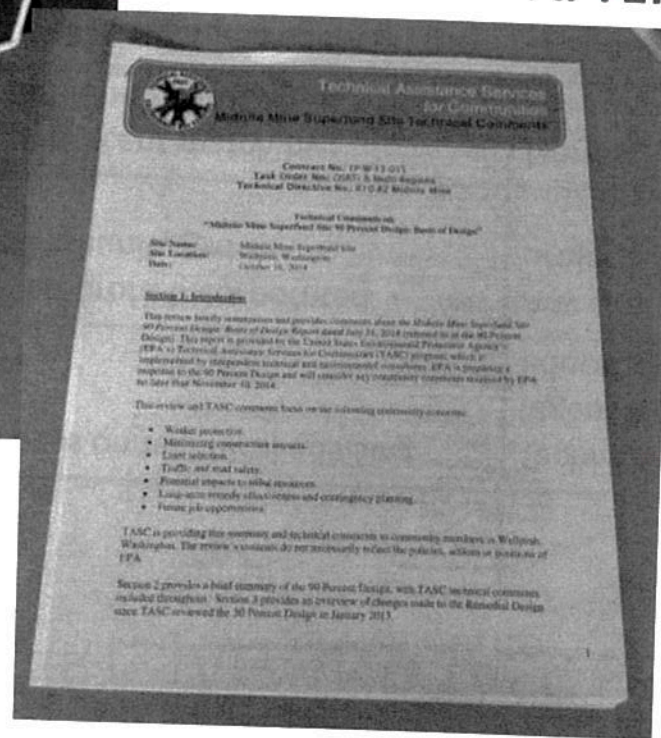
The project is a cleanup of the Grassie River, which is a tributary of the Colorado River. The project is located in the state of Colorado. The project is owned by the Colorado Department of Transportation (CDOT).





BEFORE

AFTER



OTHER SERVICES

TECHNICAL
DOCUMENT
REVIEW AND
SUMMARY

COMPARISON CHART: TAG AND TASC SERVICES

	TAGs	TASC
Types of Assistance	Focus on technical advising	Technical advising, basic facilitation (agenda mgmt.), preparation of educational materials
Eligibility	Non-profit incorporated community group	Any community-based group; projects serve entire community
Contribution	20 percent match by community group	None
Advisor Selection	Community hires advisor	TASC selects appropriate advisor
Implementation Time	Application process takes some time (months)	Shorter turnaround (weeks)
Administration	Community responsible for management	EPA managed

SUPERFUND JOB TRAINING INITIATIVE (SUPERJTI)



- Job readiness program
- Free training and job placement assistance
- Partners: local businesses, universities, labor unions, community and social service organizations, other federal agencies



CONFLICT PREVENTION AND RESOLUTION SERVICES (CPRS)

- Public participation and stakeholder involvement
- Consensus building and collaborative processes
- Expert services in conflict and issues assessment
- Alternative dispute resolution



How to request: community discussions with EPA site team

CONFLICT PREVENTION AND RESOLUTION SERVICES (CPRS)

- Professional neutral facilitators for community meetings, workshops, CAGs, for short-term or longer-term input or dialogue to bring together community representatives with diverse points of view
- Assistance in managing complex community dynamics and dialogues
- Situation assessments to analyze sources of stress or strain, dissention or dispute; to assist CAGs struggling with organizational issues or internal stresses
- Facilitation of potentially contentious discussions and meetings and complex outreach processes



MAKING EFFECTIVE COMMENTS

BUILDING A GOOD RELATIONSHIP AND EFFECTIVELY COMMUNICATING WITH REGULATORS

- Regulators are not the enemy
- You can create conditions for mutual respect by treating regulators with respect
- You can build relationships with regulators to establish the basis for productive dialogue and conversation



SEPARATING FACT FROM EXAGGERATION

- State the facts clearly and plainly
- Gather data from established sources
- Take pictures and video of site-related problems
- Make statements that are based on facts and tell about things you or others in your community have seen and experienced firsthand
- Learn about what the regulating agency has the power and authority to do and recommend specific actions you want them to take to assist your community

USING PASSION TO UNDERSCORE AND NOT OBSCURE YOUR MESSAGE

- It is ok to be angry, but try to constructively channel your anger when dealing with regulators
- Remember that human nature causes most people to shut down when they are being shouted at, cursed at or otherwise disrespected
- Being passionate does not mean being disrespectful to others



SAYING WHAT YOU NEED TO SAY IN FIVE MINUTES

- Keep statements and inquiries short and focused during meetings and phone calls
- Spend time preparing your comments or questions by organizing your main points
- Give brief statements about your thoughts, concerns or questions
- Whenever possible, provide written comments that elaborate on your verbal statement
- Written comments can be of any length



EFFECTIVE WRITTEN COMMENTS

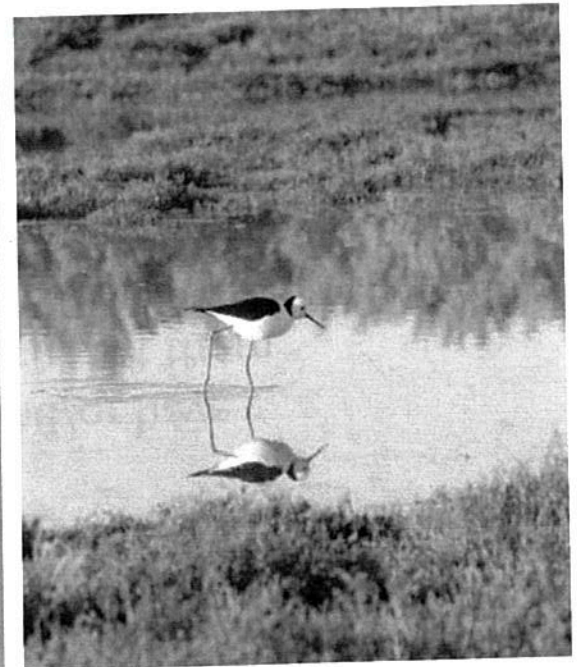
- Write specifically about the issues at hand
- Work with others to produce your written comments and/or have someone else read your written comments before you submit them
- There are two ways to proceed with written comments:
 - Have one set of comments that are signed by many people and organizations
 - Organize your community to submit many individual comments
- Be sure to include specific recommendations for how you think the regulating agency should address the issues at hand





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